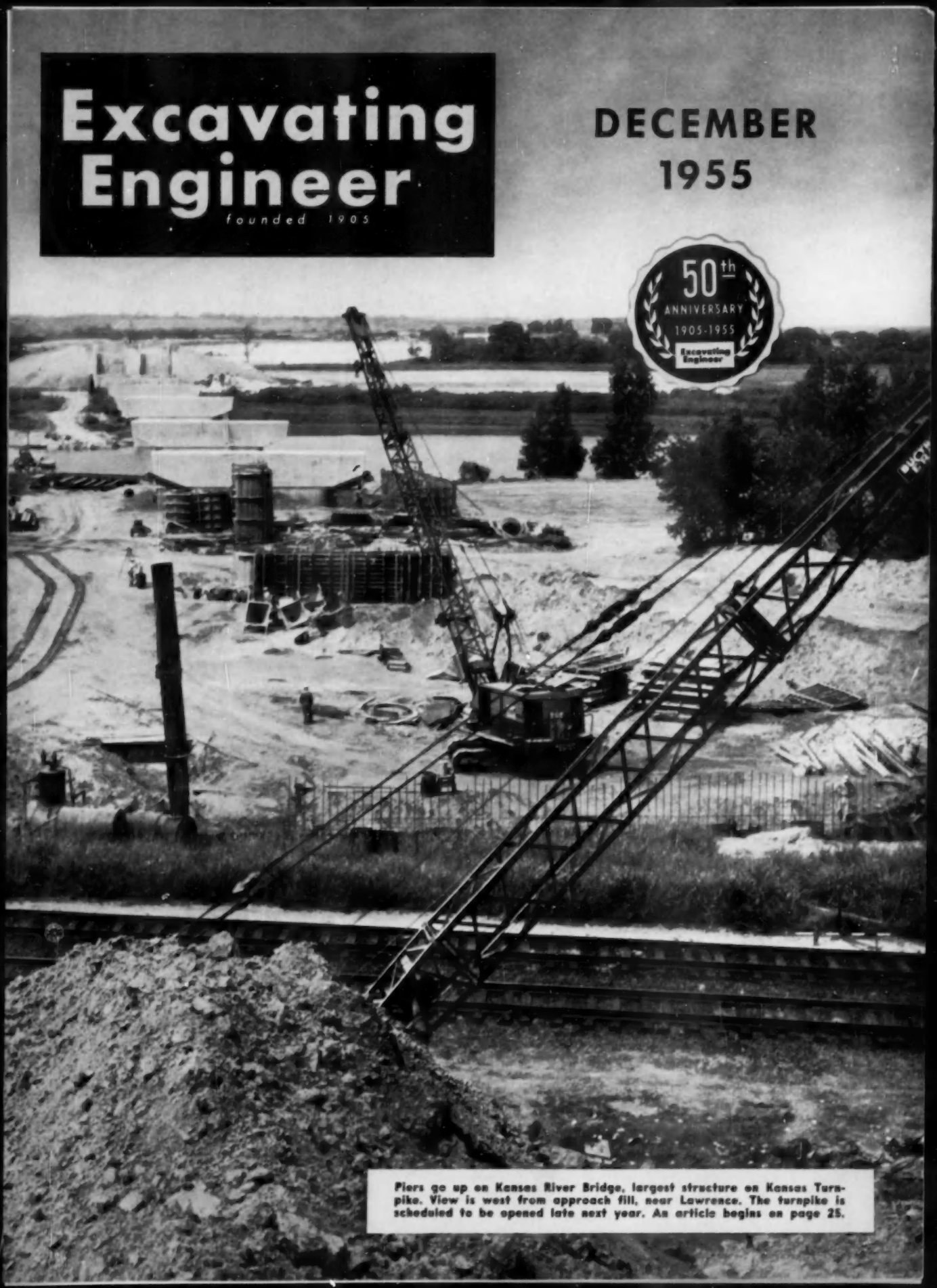
Excavating Engineer

founded 1905

DECEMBER
1955

50th ANNIVERSARY
1905-1955
Excavating Engineer



Piers go up on Kansas River Bridge, largest structure on Kansas Turnpike. View is west from approach fill, near Lawrence. The turnpike is scheduled to be opened late next year. An article begins on page 25.

In California . . . And the World Over
Bucyrus-Erie Shovels
Move Big Tonnages Year After Year

In a western iron mine this Bucyrus-Erie 6-yd. 150-B shovel moves 1,000 tons of overburden and iron ore every hour . . . and is doing it month after month. It is this kind of consistent performance, year in and year out, that makes experienced mine operators turn again and again to Bucyrus-Erie machines.

Bucyrus-Erie quarry and mining machines feature the most advanced design in the field. Unique front end eliminates excess weight, provides plenty of strength. Ward Leonard variable voltage control and simple main machinery layout are among the advantages that result in high-efficiency performance.

For excavating ability that keeps output high and costs low — and does it consistently, put a Bucyrus-Erie to work. 72L55C

GLOBAL APPROVAL
MOROCCO · PHILIPPINES · RHODESIA · UNITED STATES · VENEZUELA · ALGERIA · CANADA
INDO-CHINA · FRANCE · FINLAND · ENGLAND · CONGO
110-B 4½-cu. yd.
150-B . . 6-cu. yd.
190-B . . 8-cu. yd.
BUCYRUS ERIE

BUCYRUS-ERIE COMPANY
1880 South Milwaukee, Wisconsin **1955**
75 YEARS OF SERVICE TO MEN WHO SHAPE THE EARTH

NEW OUTPUT ABILITY

with the ALLIS-CHALMERS HD-11G TRACTOR SHOVEL

2¼-yd capacity
105 net engine hp
32,000 lb
11-ft, 7-in. dump height

NEW POWER is provided by the modern, 105-hp Allis-Chalmers diesel. Tornado Turbulence and "follow-through" combustion mean cleaner burning and more power from fuel, as well as smoother engine performance and extra long engine life. Added power pays off in extra crowding and digging ability, fast work cycles.

NEW CAPACITY. Big 2¼-yd bucket is streamlined to roll in large loads more easily. Improved design cuts spillage, clean dumping saves time and effort shaking out loads. Optional 2¼-yd tip-back bucket rolls back 25 degrees at ground level, handles bigger loads of loose material.

NEW STABILITY. Extra-long track — with almost 9 ft of track on the ground — plus 8 truck wheels on each side and 32,000 lb of weight, give the HD-11G unusual stability, plenty of traction.

NEW-TYPE HYDRAULIC SYSTEM is simpler, safer, easier to maintain. Tank has fewer external fittings. Magnetic filters and suction-line screens protect entire system. Hydraulic pump offers fast action, long life.

NEW OPERATOR CONVENIENCE. The HD-11G features easily controlled, accurate bucket action; reduced lever pull with new-type clutch; full vision; roomy platform; foam rubber seat; 60-gal fuel tank.

NEW DEPENDABILITY AND SERVICING EASE result from such features as heavy-duty truck wheels and idlers; new, long-life track; new-type, long-lasting, ceramic master clutch lining; unit construction's quick disassembly and assembly of major parts; 1,000-hour lubrication intervals for roller bearing truck wheels, support rollers, idlers.

CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

Stop in soon and see the production-boosting HD-11G at your Allis-Chalmers dealer's.

ALLIS-CHALMERS A-C

An S-18 scraper spreads 21 yds. of clay on the fill. With 300 h.p. engine and Torqmatic Drive this "Euc" has plenty of power for fast loading, hauling and spreading even in the toughest going.

A total of 688 h.p. at work here! Two 194 h.p. engines in the Euclid TC-12 Crawler and 300 h.p. in the "Euc" Scraper made short work of getting heaped loads of sand in a hurry.

Dumping their big loads on the fly, Bottom-Dump "Eucs" made fast cycle time from borrow pit to fill and back again. They were loaded by 2½ yd. draglines and a Euclid Loader.

49 "EUCS" on Heavy Road Grading Job

Contractors who know their earth moving equipment use "Eucs" on the tough, rush jobs. They know from experience that they can rely on Euclids to get more work done at the lowest cost per yard . . . and keep doing it month after month.

This 6.3 mile road project in Illinois is a typical example. S. J. Groves & Sons Co., J. C. O'Connor & Sons Co. and Potashnick Construction Inc. put 49 "Eucs" to work on a total of 2,238,171 cu. yds. of earth excavation. Grading operations started the middle of July and were completed the end of September. These contractors used 24 Euclid Scrapers, 23 Bottom-Dumps, a "Euc" Loader and a new TC-12 Twin-Power Crawler . . 47 out of 68 hauling units on the project were "Eucs"!

Hauls from borrow pit to fill ran as high as 4500' and averaged about 3000'. Daily production was around 50,000 yds. Fills of 22' to 36' were necessary to raise the road above high water level of the Wabash and Little Wabash Rivers during flood periods. Operating personnel on this job — with the biggest fleet of earth moving equipment ever used on an Illinois road project — say that "Euc" performance played the major part in completing the earth moving in such fast time.

It's performance like this that makes "Eucs" important to the profit picture on hundreds of construction jobs . . a good reason why ***EUCLIDS are your best investment.***

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

GM GENERAL MOTORS

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Excavating Engineer

founded 1905

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MORE PULL WITH LESS FUEL!

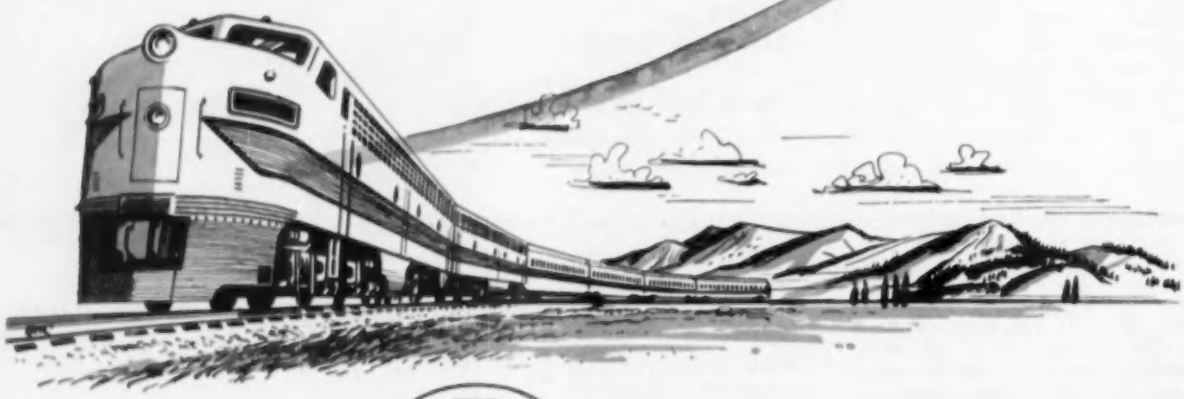
AiResearch Turbochargers provide rapid response to acceleration demands... end objectionable smoking!

Consider what the application of AiResearch Turbochargers to diesel locomotives will accomplish: A team of these small power packages will provide a greater increase in power at smaller cost in space and weight than any comparable turbocharger or supercharger installation.

In addition, specific fuel consumption on a horsepower per hour basis will be far less. Sea level performance will be restored within operating limits at altitude, response to acceleration demands will be rapid and excessive smoking under operating power eliminated. Also, the noise level will be greatly reduced.

Application in other fields will be equally effective, as has already been demonstrated in the remarkable results achieved by the installation of AiResearch Turbochargers on Caterpillar diesel machinery.

AiResearch is the largest producer of small turbomachinery in the United States, with twenty-five *million* hours of experience. This unmatched experience explains why AiResearch Turbochargers lead in power, economy and dependability.
Your inquiries are invited.



THE GARRETT CORPORATION

AiResearch Industrial Division

9225 Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND RELATED MACHINERY

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42 NORTHWESTS on the MASSACHUSETTS TURNPIKE — more than any other make!

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S. J. Groves & Sons	1 Model 25 1 Model 60D
Elmhurst Contracting	3 Model 80D's

OVER HALF THE SHOVEL EQUIPMENT ON THE WEST VIRGINIA TURNPIKE WAS NORTHWEST

WELL OVER 100 NORTHWESTS ON THE NEW YORK THRUWAY — MORE THAN ANY OTHER MAKE

OVER 60 NORTHWESTS ON THE OHIO TURNPIKE

OVER 20 NORTHWESTS ON THE MAINE TURNPIKE EXTENSION

NORTHWEST ENGINEERING CO.
1506 Field Building • 135 South LaSalle Street
Chicago 3, Illinois

NORTHWEST

FIND OUT WHY NORTHWEST LEADS ON SO MANY WELL KNOWN JOBS!

Best bet for better bids–

SPECIFY
GENERAL MOTORS DIESEL POWER

in <u>all</u> your construction equipment

You can *specify* General Motors Diesel power in over 750 different models of equipment built by over 150 manufacturers.

When you do you'll get fast-acting, quick-accelerating 2-cycle Diesel power that will help you do more work, faster, at less cost.

More work, because a General Motors Diesel is a "high torque" engine. And torque—as much as developed horsepower—measures an engine's working ability.

Faster work, because a GM 2-cycle Diesel, with its responsive governor, efficient fuel injectors and power at every piston downstroke, gives you instant pickup in response to changing loads.

Less cost, because a General Motors Diesel burns fewer gallons of safer, cheaper fuel. Also a GM Diesel costs less to buy and the parts cost less than for other Diesels of comparable ratings.

No matter where your contracts take you, you'll find GM Diesel distributors ready to supply fast service and quick delivery of low-cost factory parts. Check your local distributor today for full details on dependable, low-cost Diesel power for your equipment, or write direct for more information.

PURCHASED 23 GM DIESELS SINCE 1947

This LeTourneau-Westinghouse Tournapull is part of an earth-moving fleet used by the Lone Star Steel Company of Lone Star, Texas. The Company, one of the largest producers of steel in the Southwest, has been a consistent user of General Motors 2-cycle Diesel engines in several different kinds of earth-moving, construction and mining equipment for better than seven years.

GM
GENERAL MOTORS
DIESEL POWER

SAVING $170.00 A MONTH IN FUEL ALONE

United Construction Company cut fuel costs over 60% and reduced maintenance costs when they *switched* from gasoline to GM Diesel power on their Moretrench pumps. The GM Diesels worked 24 hours a day, 7 days a week—eliminated stops formerly required to pull and service spark plugs every three days and to replace them every three weeks.

13,000 HOURS—NO REPAIRS

General Contractor A. H. Famularo bought this GM Diesel-powered Northwest 25 Crane in April 1947. In 13,000 hours he never had an injector out, never touched the head or pan. He burns 16 gallons of low-cost Diesel fuel in 8 hours—specified GM Diesel power "because it was economical . . . and has proved to be reliable."

25% MORE WORK; FUEL COSTS ⅓ LESS

Killough Construction Company has *standardized* on GM Diesel power for their portable rock crushing plant in Kansas. The firm uses six GM Diesels to run a hammer mill, operate conveyors and screens, a primary crusher and two shovels. One shovel, converted from gasoline to GM Diesel power, now does 25% more work on one-third less fuel cost.

"WONDERFUL PERFORMER"

This GM Diesel-powered scraper hauled nine yards every four minutes on a recent job for the R. J. Boe Construction Company. Contractor Russell Boe likes the "wonderful acceleration and trouble-free performance GM Diesel power gives me." He says, "All you need to do is keep water, oil and clean fuel in that GM Diesel and you'll get a good day's work out of it."

DETROIT DIESEL ENGINE DIVISION

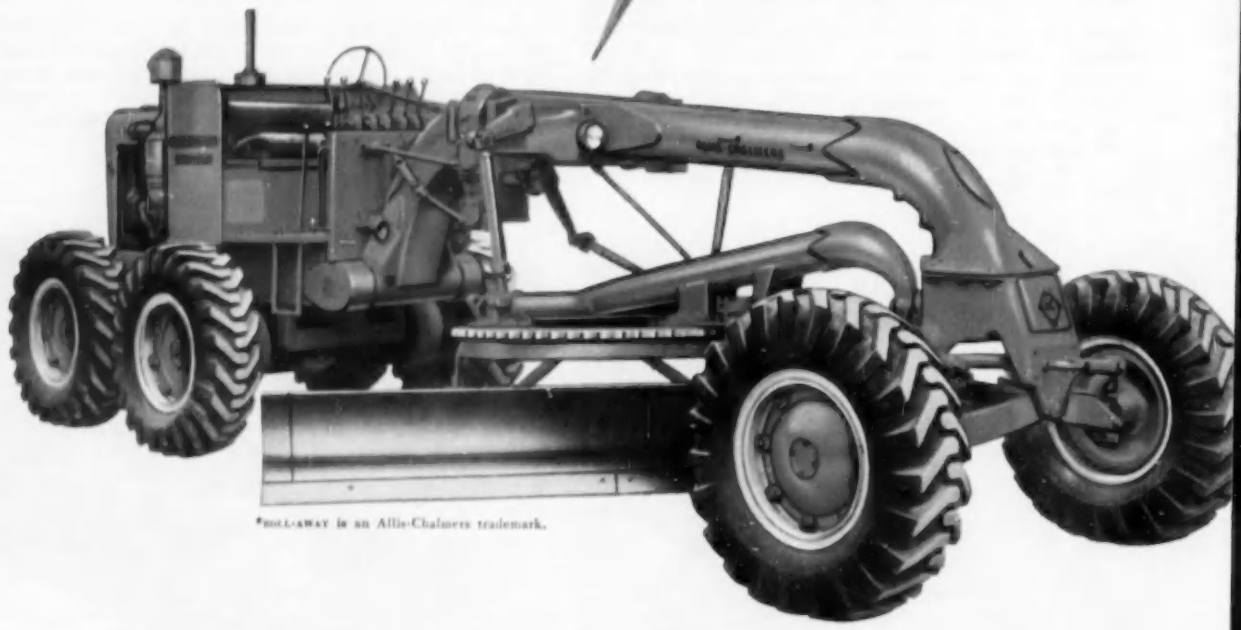
GENERAL MOTORS • DETROIT 28, MICHIGAN

Single Engines . . . 30 to 300 H.P. • Multiple Units . . . Up to 893 H.P.

NEW BIG SCALE PERFORMANCE

NEW OPERATING EASE AND COMFORT

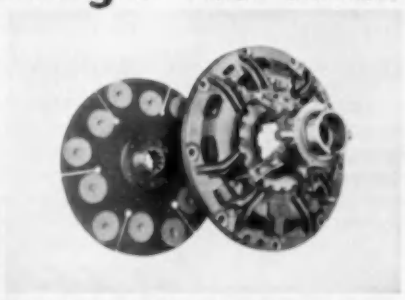
ALLIS-CHALMERS BIG NEW



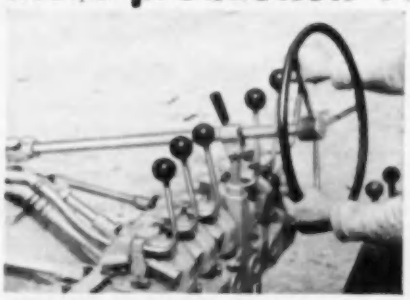
*ROLL-AWAY is an Allis-Chalmers trademark.

Major advantages that mean more production . .

Powerful new Allis-Chalmers diesel featuring exclusive "follow-through" combustion for smooth performance, clean combustion, extra-long life.



Exclusive new ceramic clutch lining sets new standards of long clutch life, keeps clutch operating longer between adjustments, reduces lever pull.



All-new toggle-type controls give a *Forty Five* operator precision control with positive "feel" — in addition to easy finger-tip action regardless of load.

Forty Five MOTOR GRADER

120 HORSEPOWER • 23,800 POUNDS

The *Forty Five* is a truly modern heavy-duty motor grader . . . designed for progress and built to *today's* standards of accuracy, dependability, operating ease and low cost. On any construction or maintenance job, you'll see all the advantages of balanced power, weight, traction and proper speeds . . . plus brand new advantages for the operator and mechanic that no other heavy-duty grader offers.

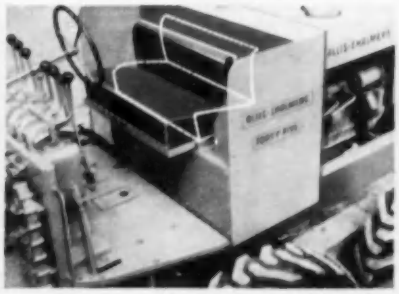
We invite you to check the features shown here. Then for the full story on the *Forty Five* — including extra-big clearances, exclusive ROLL-AWAY* moldboard, single-member tubular frame and fully enclosed power steering —see your nearby Allis-Chalmers dealer.

CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

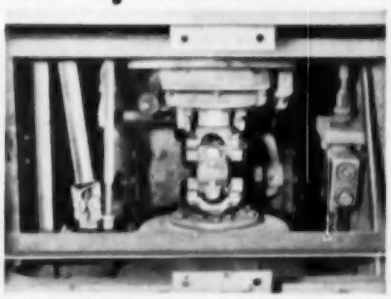
ALLIS-CHALMERS

. . less maintenance . . . easier and better operation!

New accelerator-decelerator pedal lets the operator increase or decrease engine speed with his foot — without changing his hand throttle setting.



"Box seat" comfort and visibility. Foam-rubber seat adjusts for sit-down or stand-up operation. Flat, roomy platform has tapered corners for top blade visibility.



Matchless servicing accessibility. Unit construction permits easy service or removal of clutch, transmission or engine without disturbing adjacent parts.

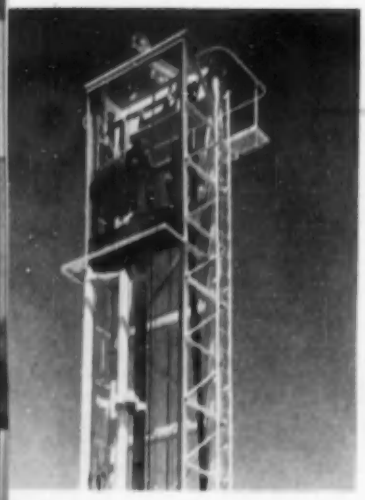
40-R and 50-R

BUCYRUS ERIE

Rotary Blast Hole Drills

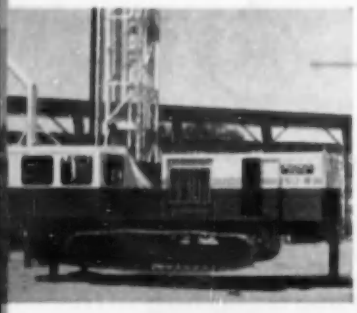
PROVIDE ALL-ROUND SPEED ON LARGE-SCALE PROJECTS

Mines, quarries, and big construction jobs profit from the high-speed, large-diameter hole making ability of Bucyrus-Erie rotary blast hole drills. In shallow or deep holes, you get speed every minute.



Speedy Tool Handling

To make up a tool joint, a remote-controlled tool storage rack swings your selection of drill pipe into place above the hole and centers it under the rotary drive machinery. The rotary machinery is lowered to meet the drill pipe; then rotary coupling and pin joint on the drill pipe are screwed together under power. Make-up is counted in seconds. Dismantling is equally fast.



Move-Up Speed

Travel over rough ground and through mud is fast because of the tractor-like mobility of the crawler mounting. Excellent stability permits most moves to be made with the derrick up. Set-ups are simply a matter of leveling the machine again. Hydraulic jacks quickly correct machine tilt.

Drilling Speed

The entire length of each drill pipe section can be drilled down in one non-stop run. Both rotary drive and pulldown force are applied at the top of the drill pipe and follow it all the way down. That means fast hole on your job. Hole progress is continuous, too, because rotation speed can be changed instantly as needed through Ward Leonard electric control, and down pressure can be varied through hydraulic control. Instant speed and pressure adaptation mean faster hole on your job. All controls — electric, hydraulic, and air — are conveniently grouped on one central panel.

30855C

There are two Bucyrus-Erie rotary drill models. The 40-R drills 6¼ to 9-in. holes and offers a choice of diesel-electric or full electric power. Model 50-R drills 9⅞ to 12¼-in. holes and is electrically powered. For detailed, illustrated bulletins, write today to —

BUCYRUS-ERIE COMPANY South Milwaukee Wisconsin

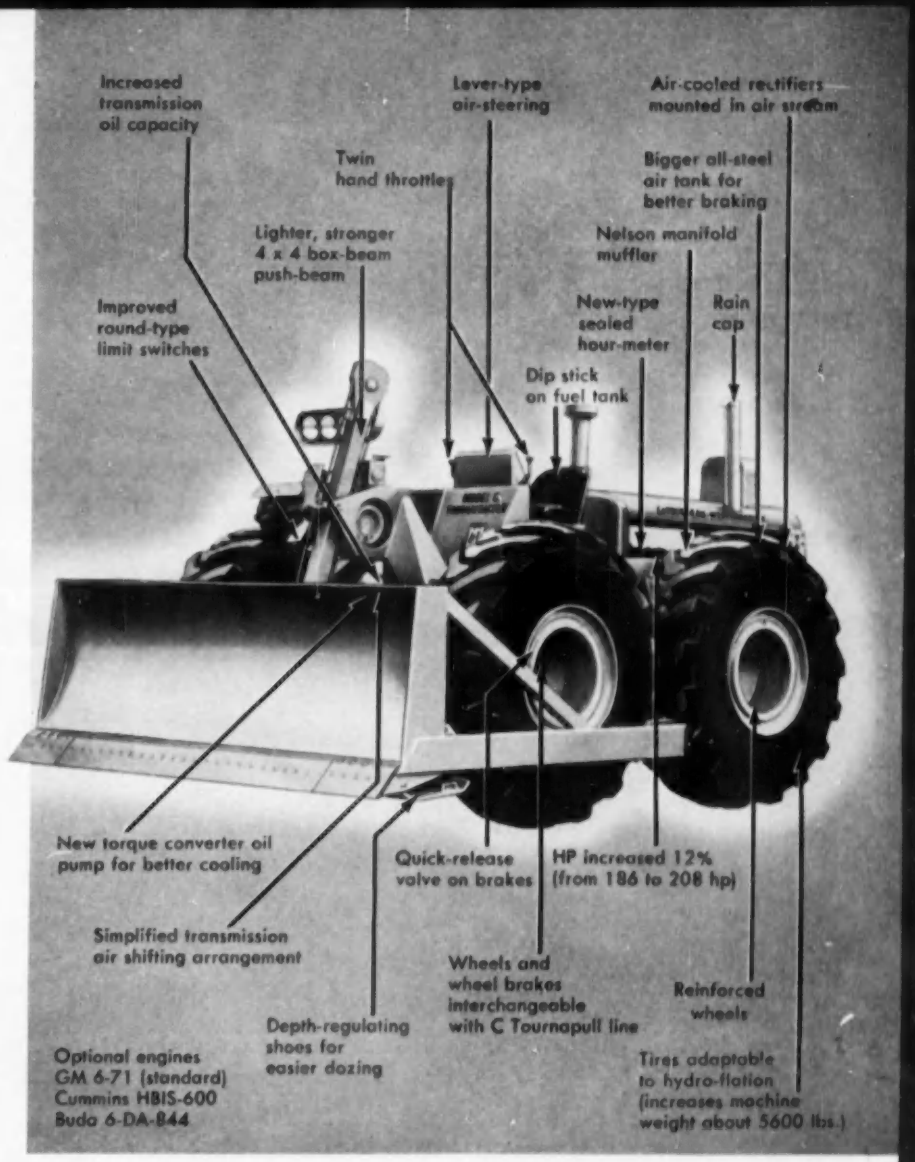
IMPORTANT CHANGES

have been made

Since the LeTourneau-Westinghouse Company was formed in 1953, many important machine improvements have been made. All these shown are standard on current-production models of the rubber-tired C Tournatractor. Study them for yourself . . . then let us show you first-hand what they can mean to you.

Ask for demonstration

Call us anytime. We'll be glad to drive a *new model* Tournatractor to your job, then work it until you're convinced. There is no obligation, no cost to you.

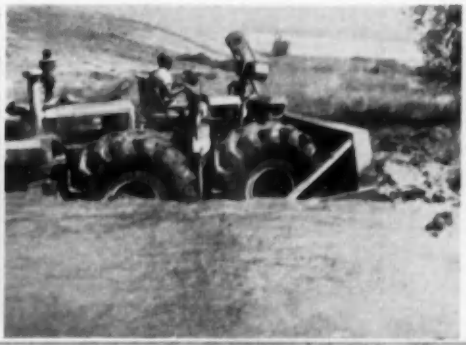

Increased transmission oil capacity
Lever-type air-steering
Air-cooled rectifiers mounted in air stream
Twin hand throttles
Bigger all-steel air tank for better braking
Lighter, stronger 4 x 4 box-beam push-beam
Nelson manifold muffler
Improved round-type limit switches
New-type sealed hour-meter
Rain cap
Dip stick on fuel tank
New torque converter oil pump for better cooling
Quick-release valve on brakes
HP increased 12% (from 186 to 208 hp)
Simplified transmission air shifting arrangement
Wheels and wheel brakes interchangeable with C Tournapull line
Reinforced wheels
Depth-regulating shoes for easier dozing
Optional engines GM 6-71 (standard) Cummins HBIS-600 Buda 6-DA-844
Tires adaptable to hydro-flation (increases machine weight about 5600 lbs.)

Tournatractor—Trademark Reg. U.S. Pat. Off. T-800-G-b

Breaking up rock seams, pavement, etc., Tournatractor can tackle as tough jobs as any crawler. Loading may be slower and cuts thinner on some heavy materials, but faster push and return save time. On long pushes, Tournatractor often doubles crawler output.

Tournatractor's sealed power-train takes it safely through water, mud, dust . . . prevents damage and wear to bearings and moving parts. Lubricants are not washed away nor filled with abrasives. Maintenance is lower since 4 wheels do work of 500 track parts.

Ideal for scattered jobs, Tournatractor spends minimum time in travel. Top speed is 19 mph . . . 1,670 ft. per minute. Rig goes anywhere without planking . . . travels over pavement or cross-country . . . needs no loading, no extra men or expense for trailer-haul.



LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

The American Road Builders' Association

invites you to Miami Beach to attend its

54th ANNUAL CONVENTION

EXHIBIT OF HIGHWAY MATERIALS and SUPPLIES

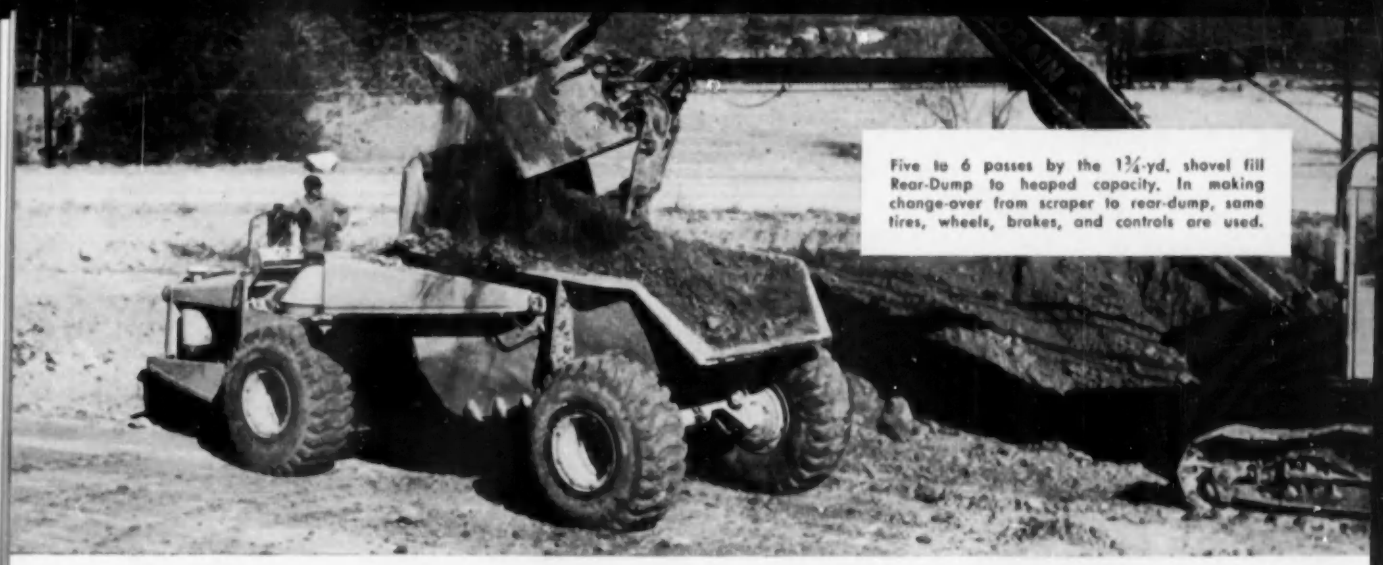
Both Meetings and Exhibits will be held in the

Miami Beach Auditorium

JANUARY 11-14, 1956

The Nation's leading legislators, engineers, and road builders will address this Meeting—the most important in ARBA's history. Write to ARBA in Washington for information on hotel reservations and Exhibit arrangements.

American Road Builders' Association • World Center Building • Washington 6, D. C.



Five to 6 passes by the 1¾-yd. shovel fill Rear-Dump to heaped capacity. In making change-over from scraper to rear-dump, same tires, wheels, brakes, and controls are used.

Alabama contractor shows how to get "double value" from each dollar of equipment investment

"Interchangeability" has a powerful meaning to Clyde O. Mitchell, Birmingham. It's the way he assures himself "double value" from his versatile C Tournapulls.

For dirtmoving, Mitchell hitches 14-yd. scrapers behind his 2-wheel "C" prime-movers. Whenever he encounters shovel rock, he switches scraper bodies for rear-dumps to handle this problem. The ability to switch to rear-dumps eliminates added ownership or rental expense of trucks, reduces maintenance cost as well as equipment and parts inventory, and permits operation under weather and haul road conditions that would shut down truck operation.

Double duty means added profits

Mitchell has made extra profits twice so far on important jobs because of this quick-change feature of his C Tournapulls.

First double-duty assignment was a state highway improvement job at Decatur, Alabama. On this job, the scrapers handled 800,000 yds. of dirt, while Rear-Dumps moved 100,000 yds. of rock.

Recently he relocated and straightened 4.1 miles of State Highway 431 between Attalla and Boaz. Here, of the 486,000 cu. yds. of material to be moved, about 16% was rock, 75% chert, and 9% clay. The dirtmoving was handled by two C Tournapulls with Scraper, three 18-yd. tractor-drawn FP scrapers, and three self-propelled scrapers of another make. The Tournapulls were then equipped with Rear-Dumps to haul rock . . . about 78,000 yards.

4200′ cycle every 6 minutes

Time studies show the Tournapull Rear-Dumps are real producers. With wide, easily entered bodies, they were loaded with 10 pay yards by a 1¾-yd. Lorain shovel in an average of 1 minute, 40 seconds. Working 4200′ cycles, each round-trip took only 6 minutes. Haul and return speeds averaged 12 mph. Hourly output for the 2 machines was 180 pay yards per 55-minute hour.

More speed on long hauls

This kind of production and Tournapull interchangeability highly pleases the owners. Says Supt. G. M. Wakefield: "I like the C Tournapull prime-mover. It's got a good scraper and rear-dump. It will stand up against any dirtmover."

Adds operator C. L. Moore: "The Tournapull can turn everywhere, and it's got more speed on long hauls. It's simple to understand . . . easier to operate than other rigs."

Figure out for yourself on the basis of cost alone the extra value of Tournapull interchangeability. An additional haul unit costs about 25% of the total initial price of prime-mover and original haul-unit combination. Interchangeable haul-units can be purchased at any time.

Find out how this double-duty equipment can give *you* double earning power for every dollar of investment. For more facts and owner-verified case histories, write or phone today.

Dumping on the run, Rear-Dump builds subgrade in cut where rock has been removed. Average dumping time was about 20 seconds. Electric controls respond instantly for steering and controlled dumping.

Tournapull—Trademark Reg. U.S. Pat. Off. R-801-H-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

Bucyrus-Erie 38-B shovel excavated one-third of total yardage on this job with rock and conglomerate predominant material.

CALIFORNIA CONTRACTOR PASSES TOUGH TEST ON FIRST BIG JOB

When this Southern California contracting firm was awarded the contract for rebuilding 8.16 miles of secondary highway in east-central California, work plans had to be made carefully. A few of the reasons: the job was in a remote location between Bridgeport and the Nevada line, 8000 feet up in the Sierras, and through plenty of tough granite rock.

Breakdowns were the principal worry, for this was the biggest job the firm had ever tackled. Two major decisions were made: (1) to use equipment known for dependability, and (2) to service each piece up to factory-approved standards.

A new 1½-yd. Bucyrus-Erie 38-B shovel took over the toughest excavating. Pre-bid estimates were based on 1,000 cubic yards of excavation per 8-hour shift for this machine. Weeks went by and the 38-B worked a full shift daily with no lost time, handled boulders up to 72 inches in diameter, and dug rock so well that blasting was negligible. Final yardage figures for the long-haul phase of the job showed the 38-B averaged up to 1,200 cubic yards per shift — 20% better than the pre-bid estimate.

This same 38-B, equipped with dragshovel front end, just completed another difficult job for its owner, I. L. Croft & Son, Inc. of Saugus, California. This one was the construction of an aqueduct for the City of San Diego and, once again, Bucyrus-Erie dependability and big-output performance helped the owner finish the job on time, and at a profit.

That same kind of performance is ready to go to work for you — in excavators from ⅜ to 4-yd. sizes. See your Bucyrus-Erie distributor soon for complete information.

99E55C

Here the new highway hugs the bank of the East Walker River, 6,000 ft. up in the Sierras.

BUCYRUS ERIE

South Milwaukee Wisconsin

1880 75 1955

YEARS OF SERVICE to Men Who Shape the Earth

8250 pay yards daily

with 11 C Tournapulls on 2.4-mile cycle

After spreading sand in wet, soft fill, C Tournapull makes turn and starts back on rough 1.2-mile trip to borrow-pit. "C Tournapulls will turn shorter on fill giving them an advantage over others, especially in wet fill," says Supt. J. W. Franks.

"Our judgment was sound when we selected 'C's' for the job," *says Supt. J. W. Franks*

Public Constructors Inc., Pleasantville, New Jersey, are keeping production ahead of schedule, despite tough conditions on the 2¼-million yard contract for the Garden State Parkway in Cape May County. Working continuously in loose, shifty, 100% coarse-to-fine white sand, their 11 C Tournapulls are playing a major role in speeding the job. The "C's" performance is due to:

1. Ability to load, haul, and spread the abrasive material faster and easier than similar units made by other companies.
2. 30 mph speed which saves time and money on the tough, long hauls common to this job.
3. Fewer repairs and 10% more "job availability" through less down-time than other rigs.

2.4-mi. cycle every 10⅓ min.

Here's a typical C Tournapull work day: Machines are push-loaded in a sand borrow-pit by HD20 crawlers. Loading is difficult because of loose, shifty footing. After loading, the units climb a 3% grade out of pit, make sharp, 90° right turn, and start the 1.2-mile haul to North Lane, or fill area. The 70 to 95′ spread is in wet, soft, sandy fill which makes maneuvering difficult. After spreading material, 180° turn is made for return trip. The 2.4-mile cycle averages about 10½ minutes. Each unit carries 9 loads, averaging 14 pay yds. per load, every 1½ hours. Working 55-minute hour each "C" moves 750 yards per day. The entire fleet of 11 "C's" move 8,250 pay yards daily.

Job 15% ahead of schedule

Considering all the adverse conditions encountered throughout the job, production has still been running 15% over estimates, based on these 11 Tournapulls. Supt. John W. Franks says, "Our earthmoving production records show that our Tournapulls are giving a great performance day-after-day. Our judgment was sound when we selected 'C's' for the job."

Why not try these advantages on *your* next job? Let us compare the "C" by operating it alongside one of your present machines. You'll find it loads faster, hauls faster, and returns faster, especially in tough-to-handle materials. Write or phone for a demonstration today. There's no obligation.

Will scrapers uncover buried pirate treasure?

Where Captain William Kidd, famed British buccaneer who was hanged for piracy in 1701, buried his ill-gotten gains—or if he buried them at all—has long been a mystery. Legend has it that some of his loot is buried in eastern New Jersey, along the route of the Garden State Parkway, near the work-site shown above. One Monmouth County property owner believed in this so strongly that when he sold some land to the N. J. State Highway Authority recently, he insisted upon reserving a claim to any such riches that might be uncovered during construction. But, so far—and the parkway is nearly completed—no buried treasure of any kind has been found on this property—or any other.

(Taken from Better Roads, April, 1955 issue)

Tournapull—Trademark Reg. U.S. Pat. Off.
P-536-H-b

NOW . . . a size Tournapull TO FIT YOUR NEEDS

Model B . . . 23 yds. heaped Model C . . . 16 yds. heaped Model D . . . 7 yds. heaped

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

. . . and a fast tip

For hard work and sheer economy this massively built Heavy Duty Dumper is unequalled. Fast, controlled tipping up to 70 degrees, two-way steering and four-speed drive, forward and reverse—they all add up to minutes knocked off every trip, costs cut every working day over many years.

FOR FULL PARTICULARS PLEASE WRITE FOR PUBLICATION No. 1688M

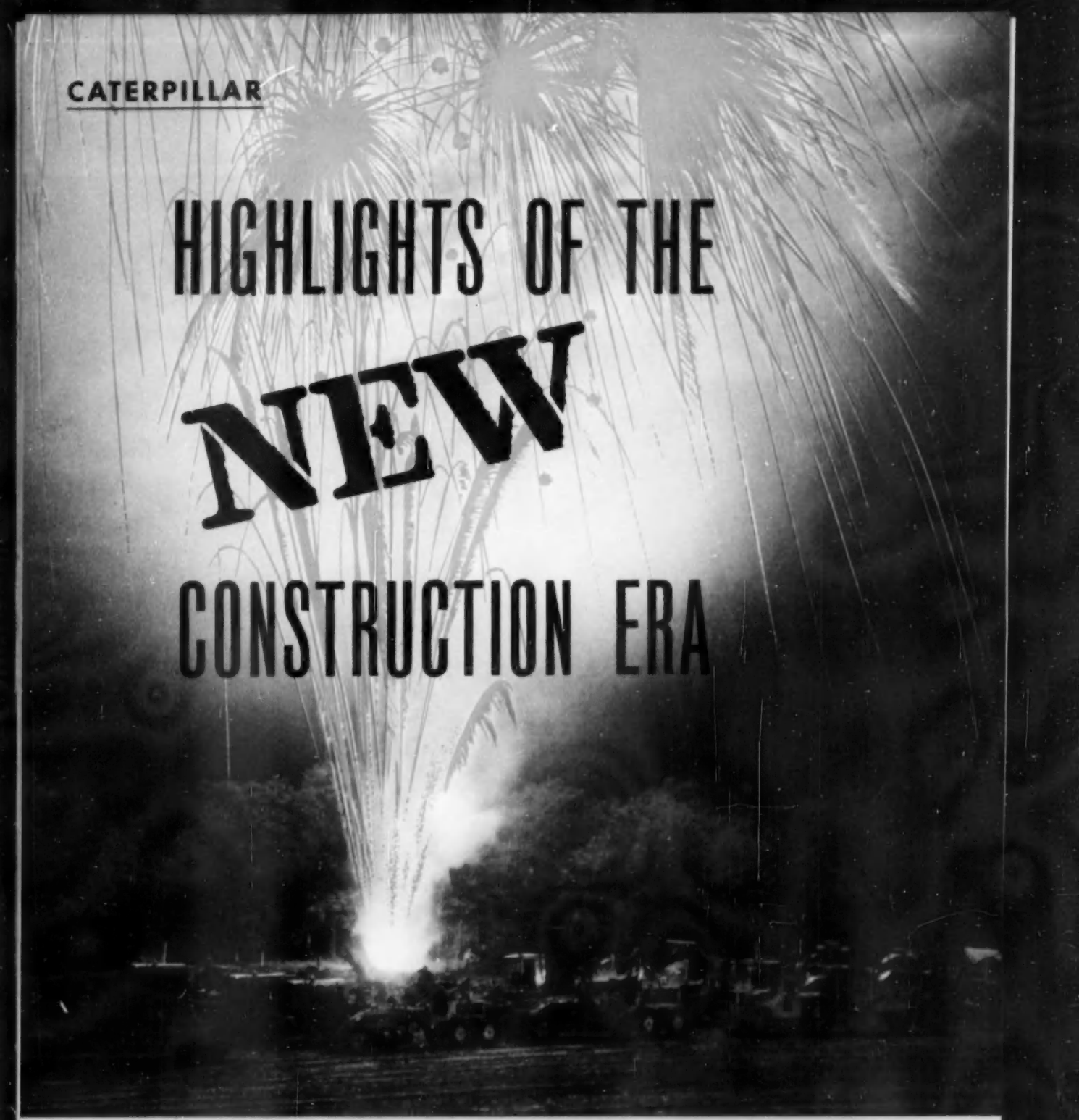
AVELING-BARFORD SL

20,000 lb. DUMPER

AVELING-BARFORD LIMITED GRANTHAM ENGLAND

CATERPILLAR

HIGHLIGHTS OF THE NEW CONSTRUCTION ERA



Never before in history has the equipment industry faced such a tremendous challenge as today. We are entering what might well be called the "construction era." Right now construction is the greatest single factor in our industrial economy, employing 12% of our total labor force. And construction can never move forward by itself. Its progress is dependent upon increased production in mines and forests, cement mills and steel plants. Caterpillar Tractor Co. is matching these new opportunities with an array of new products that will increase production, cut maintenance costs, work longer and more profitably than any other equipment on the market. These Caterpillar-built products are the result of continuing research in the laboratory and in the field. They are forceful evidence of Caterpillar Leadership in Action. See them on the following pages.

NEW in track-type tractors!

The new D9

This new giant is a bear for work. Choice of torque converter or exclusive oil clutch drive. First track-type tractor with Turbocharger. Completely new 286 HP engine. "Live-shaft" drive for rear-mounted equipment. Many other important features.

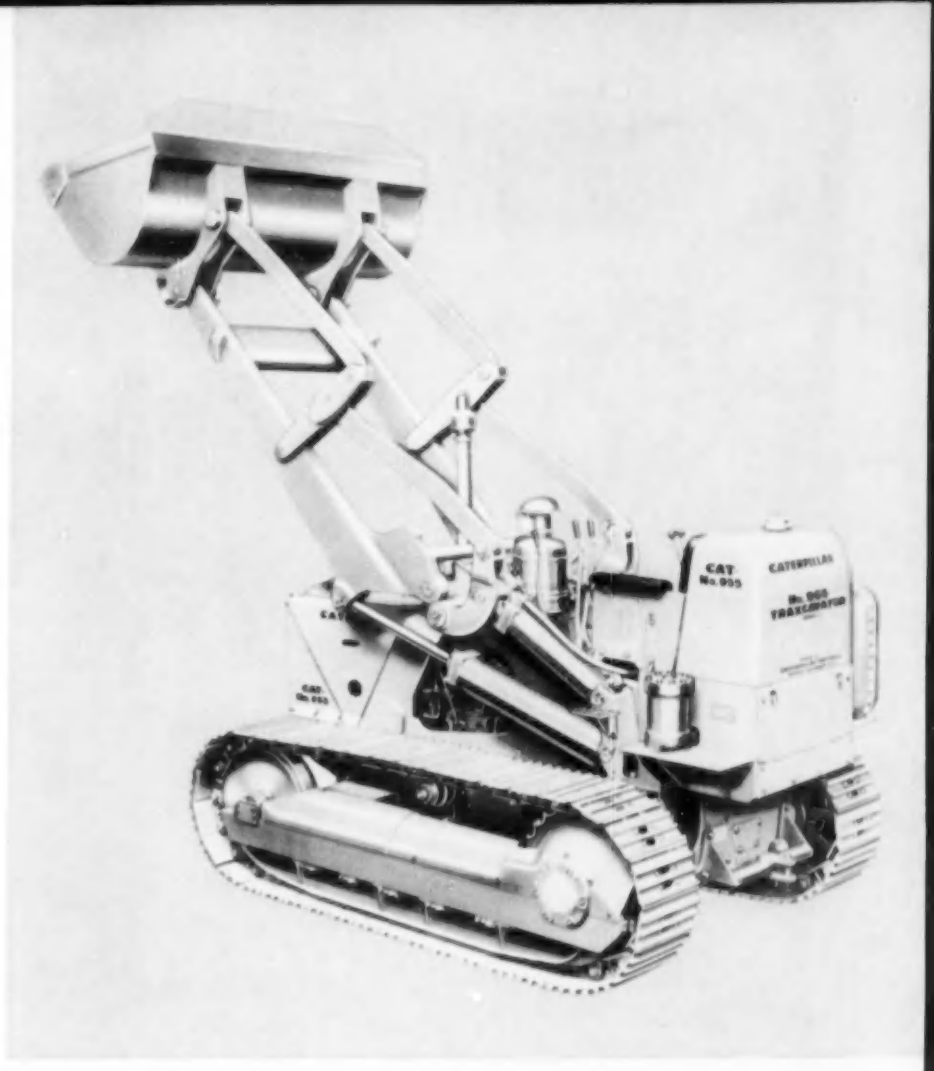
The new D8

With torque converter (Series D) or direct drive (Series E). Completely new 191 HP engine. "Live-shaft" drive for rear-mounted equipment independent of flywheel clutch. New easy controls. Many other improvements. Shown with new Cat No. 463 LOWBOWL Scraper.

The new D7 (Series C)

New 128 HP engine. Drawbar pull 28,700 lb. maximum. Exclusive oil clutch. Finger-tip steering. New starting engine for easier operation. Track shoes hardened by "*water quench*" process (also on D8 and D9). Many other important advances.

LEADERSHIP IN ACTION



No. 955—1½-yard capacity

Balanced for bigger production at lower cost. Major features: 40-degree bucket tip-back at ground level, new oil-type clutch, convenient lift and dump levers, modern hydraulic system, high reach, "designed in" operator comfort, optional starting and versatile attachments.

NEW in Traxcavators!

No. 933—1-yard capacity

Like its bigger brother, *balanced* to outproduce ordinary tractor-shovels of equivalent capacity. Also backed by *one* manufacturer to provide you the advantages of single manufacturing responsibility and one service source. Major features—same as the No. 955!

LEADERSHIP IN ACTION

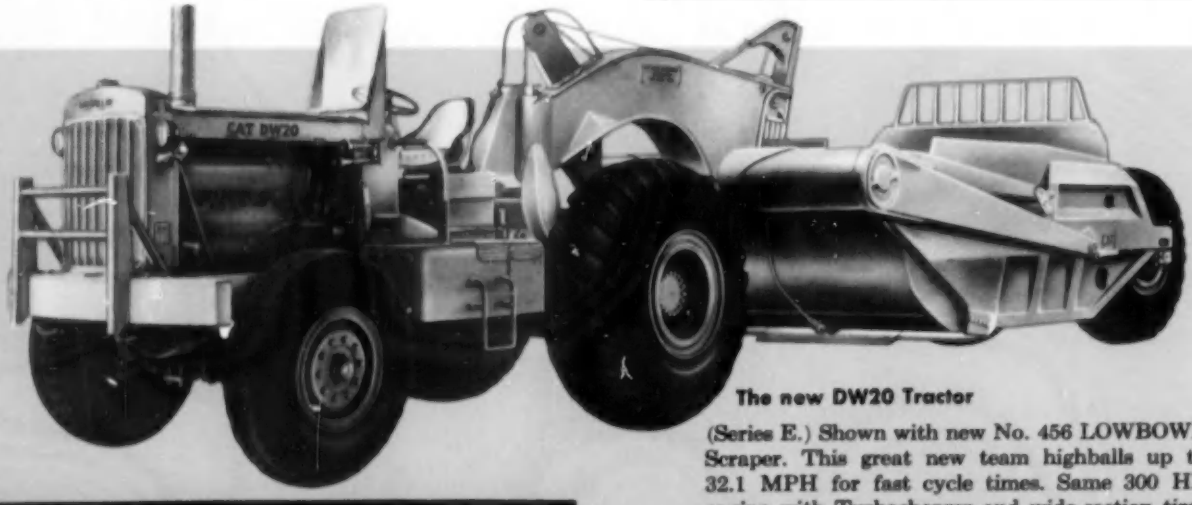
NEW in wheel-type tractors!

The new DW21 Tractor ▲

(Series C.) New 300 HP Caterpillar Engine with Turbocharger. 10% more rimpull. New No. 470 LOWBOWL Scraper. 18 cubic yards struck, 25 cubic yards heaped capacity. New, wide-section 29.5-29 tires give big-footprint flotation and maximum traction. Many other new, thoroughly tested features.

The new DW15 Tractor ▶

(Series C.) 186 HP valve-in-head Caterpillar Engine. Speeds up to 24 MPH (31.3 MPH with optional gears) pulling loaded wagon or scraper. Heavy-duty clutch has air booster. Air brakes. Wide range of speeds: 10 forward, 2 reverse.



The new DW20 Tractor

(Series E.) Shown with new No. 456 LOWBOWL Scraper. This great new team highballs up to 32.1 MPH for fast cycle times. Same 300 HP engine with Turbocharger and wide-section tires as DW21. LOWBOWL design loads more material in less time by using tractor and pusher power at maximum efficiency.

LEADERSHIP IN ACTION

NEW in pipelayers!

The new No. 583

Here, for the first time, is a pipelayer that is *all* pipelayer—not a tractor attachment. It's the most efficient, highest capacity pipelayer in history. Lifting capacity of 130,000 pounds and 21-inch clearance. Three-stage torque converter in main drive and new hydraulically actuated counterweights. Stability is unequalled. A heavy-duty constant-mesh pipelayer winch transmission drives directly from the engine. Many more important advances, all designed to produce more profits for pipeliners.

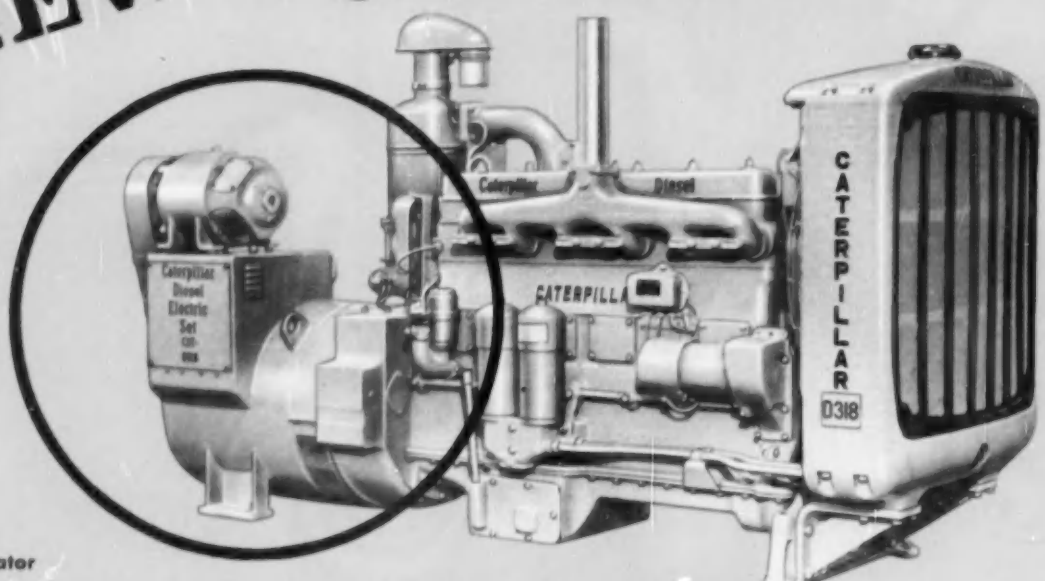
NEW in motor graders!

The new No. 12 with oil clutch

With the addition of the job-proven oil clutch, the big, versatile No. 12 Motor Grader gives you more economy and efficiency than ever. The new clutch increases work life since the constant oil bath lubrication reduces wear on all moving parts. There is less maintenance; 1500 hours without adjustment is not unusual and no external lubrication is needed. The new No. 12 is more efficient because the clutch is constantly cooled, eliminating clutch fade and slippage due to overheating.

LEADERSHIP IN ACTION

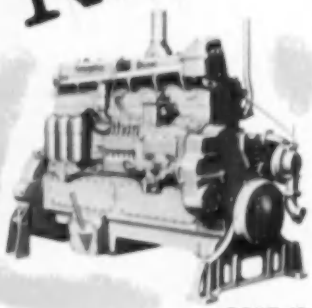
NEW in generators!



Cat Generator

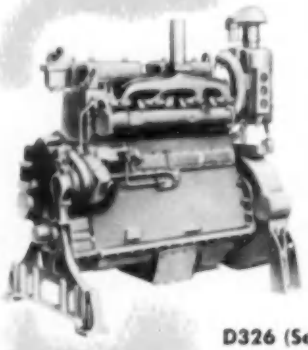
A major development in modern electric power. Brings to Caterpillar's new line of Diesel Electric Sets the efficiency of the externally-regulated set in a self-regulated set. Many advantages! Close regulation of voltage, simple control, excellent motor-starting ability, easy hook-up with other generators . . . 100% backed by Caterpillar.

NEW in diesel engines!



D342—210 HP maximum @ 1200 RPM

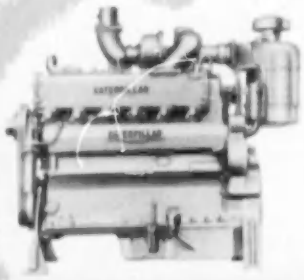
Incorporates the latest advances in modern, compact, heavy-duty diesel design. Offers better operation, less maintenance, higher horsepower. Choice of 3 starting systems—air, electric, gasoline. Like all Caterpillar Engines, burns wide range of fuels without fouling.



D339—140 HP maximum @ 1200 RPM

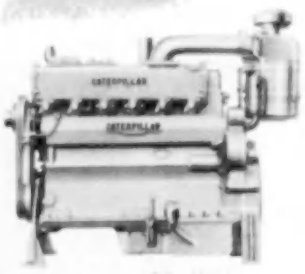
Combines new compactness with greater efficiency, economy and higher horsepower. A modern, heavy-duty 4-cylinder unit with new smoothness of operation. Choice of 3 starting systems. Many other advantages, including full-flow filtering system.

D337 (Series F) with Turbocharger 310 HP maximum @ 2000 RPM



New Turbocharger utilizes exhaust heat to drive supercharger, delivers air in proportion to engine's need. New hydraulic valve lifters practically eliminate adjustment, provide quiet operation. Greater displacement for more power. Choice of 3 starting systems. Available as Electric Sets and Industrial Engines with complete line of attachments.

D326 (Series F)—200 HP maximum @ 2000 RPM

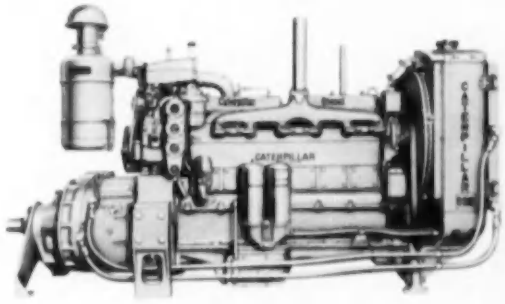


Like other new, heavy-duty Cat Diesels, offers you more for your money than any engine in its power range. Many major features, including hydraulic valve lifters and full-flow filtering. Greater displacement for more power. Choice of 3 starting systems. Available as Electric Sets and Industrial Engines with complete line of attachments.

LEADERSHIP IN ACTION

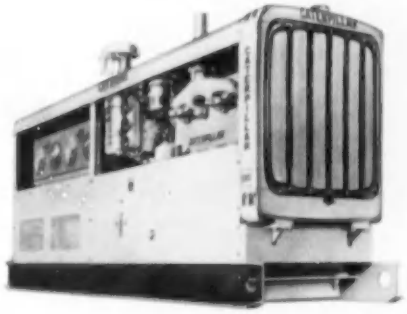
NEW in torque converters!

Caterpillar now offers a wide choice of torque converter power units in standard packages. Torque output is automatically matched to load for smooth load starts or control of load without use of clutch. Overloads can't kill engine. Your Caterpillar Dealer can supply these units. He also has full facilities and parts for service.



NEW in welders!

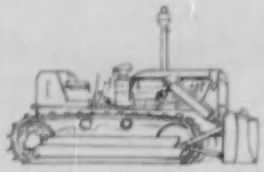
The new Caterpillar Twin Arc-Welder provides one engine, one base, and TWO 300-ampere welding generators. Four-cycle Cat Diesel picks up load instantly without missing or injector trouble. Compact design cuts transport and maintenance cost. Operators can weld at different voltages at same time. Single (3 KW) exciter cuts weight and size, provides ample excitation plus plenty of 115-V. DC for auxiliary tools.



NEW in portable electric sets!

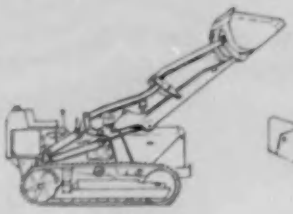
Cat Portable Electric Sets are now available in nine models, 30 to 315 KW, and in all usual voltages, 50 to 60 cycle. They're complete units with cooling system, fuel tank and switchgear, mounted on skids, semi-trailer or full trailer. Easy to hook up and operate, ready to work anywhere.

LEADERSHIP IN ACTION

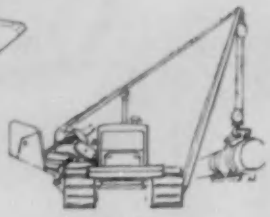


TRACK-TYPE TRACTORS

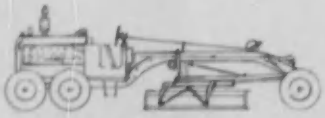
WHEEL-TYPE TRACTORS



TRAXCAVATORS



PIPELAYERS

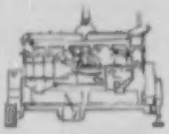


MOTOR GRADERS

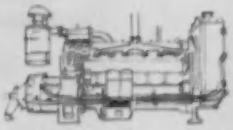
SCRAPERS

BULLDOZERS

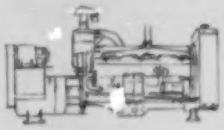
RIPPERS



INDUSTRIAL ENGINES

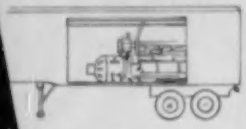


TORQUE CONVERTERS



GENERATORS

FOR YOU CATERPILLAR LEADERSHIP PROVIDES THE MOST COMPLETE LINE IN THE INDUSTRY



PORTABLE ELECTRIC SETS

WELDERS

Year after year you have seen the results of Caterpillar leadership. It is always in action. It never stands still. The full resources of Caterpillar research, both in the laboratory and right in the field with you, are constantly devoted to improving products and developing new ones. This means that Caterpillar is your partner in progress, bringing you better and better products, greater opportunities for profitable work. Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

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LEADERSHIP IN ACTION

PRINTED IN U. S. A.

Excavating Engineer
founded 1905 DECEMBER, 1955

Piers 1, 2, 3 and 4 of the Kansas River Bridge—part of the future Kansas Turnpike—are seen in view from the east bank.

Kansas Turnpike: Yesterday's Santa Fe Trail

Excavation for piers began early this year. Shown at work on pier No. 1 are two Bucyrus-Erie 38-B's, rigged as draglines. Another 38-B also was used for excavating.

WHEN many of the first settlers in the territory that is now the great Southwest moved westward, they took the Santa Fe Trail out of Kansas City. In their cumbersome prairie schooners it took them weeks, often months, to reach their promised lands. Some of them settled in the area that is now the state of Kansas. Others continued south-westward through Topeka, Emporia and Wichita, from where the old Chisholm Cattle Trail took them to Oklahoma City and beyond.

Today a new super highway is under construction between Kansas City, Kan., and the Oklahoma-Kansas line south of Wichita. The new turnpike follows the same general direction as the old Santa Fe Trail, but any resemblance to the

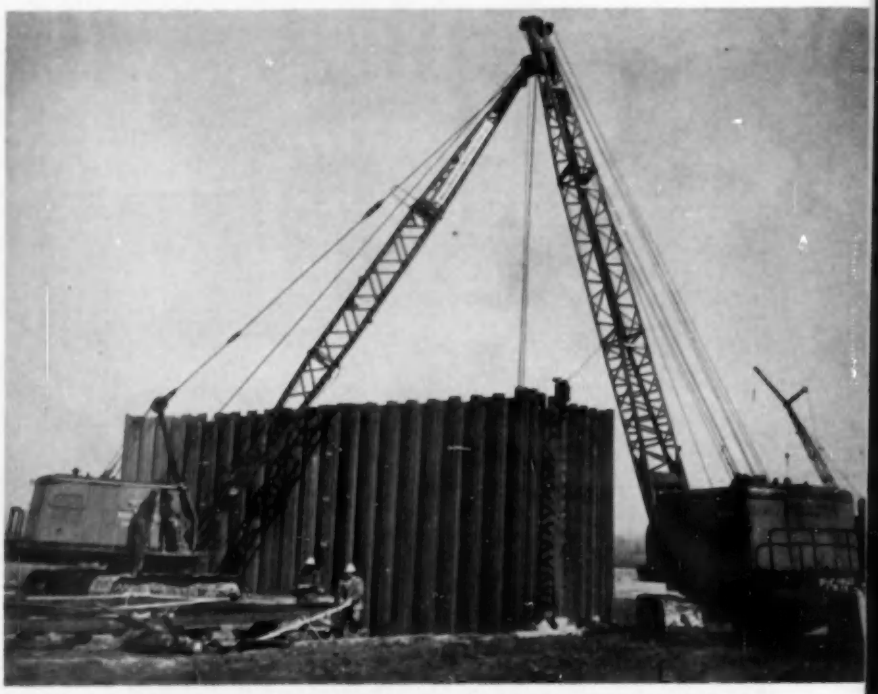
236-mile super road will follow same general direction as the famous trail.

Santa Fe Trail of old and the new four-lane highway is in direction only.

The 236-mile highway, to be known as the Kansas Turnpike, is being built at a cost of approximately $160 million. It is being financed by revenue bonds which will be secured by tolls and other turnpike revenue on a 40-year plan. The turnpike will run from Kansas City to Oklahoma by way of Lawrence, Topeka, Emporia, El Dorado and Wichita. It will be the longest limited access highway west of the Mississippi River and is expected, in the future, to be an important link in a transcontinental system of turnpikes reaching from Maine in the northeast to Arizona and California in the southwest. Studies have been made by the state of Oklahoma to continue the Kansas Turnpike from its southern terminus through Oklahoma City to the Oklahoma-Texas border.

Present highway distances between points along the new route have been reduced. From Kansas City to Wichita, for example, a saving of 25.8 miles will be realized by the more direct route.

The roadway will consist of two

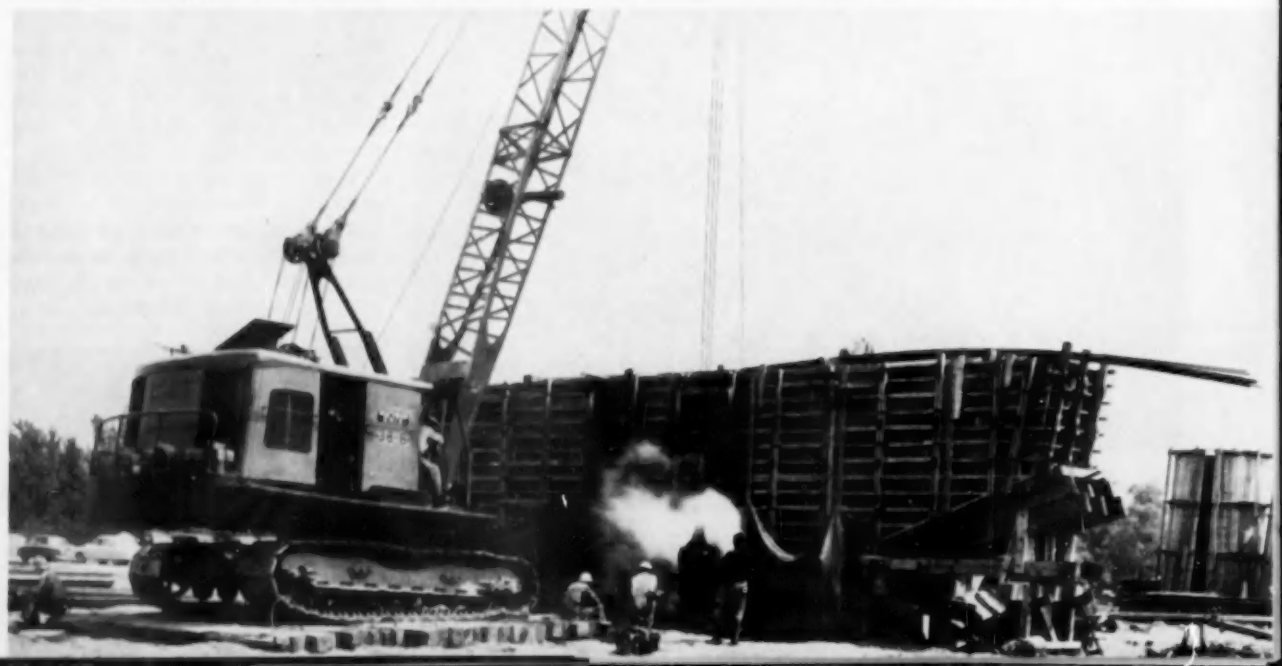


Two 38-B's combine to help erect cofferdam at site of pier No. 2. Overall length of the bridge is 4,050 feet, including fill between highway and railroad tracks.

24-ft. lanes separated by a 20-ft. depressed median strip. Ten-foot paved shoulders will be constructed along the outside of each roadway, and 4-ft. inner paved shoulders will provide additional safety for passing vehicles. The right-of-way in all rural sections will be 300-ft. wide. Curvatures and sight distances along almost the entire route will permit speeds in excess of 70 mph.

Ingress and egress on the turnpike will be limited to the two terminals and to 10 intermediate points. The eastern

(Above) Workmen put in cofferdam No. 6. (Below) A Vulcan 1200-A extractor is used by the 38-B to pull up steel sheet piling.



terminus is located on Muncie Boulevard at 18th street in Kansas City, Kan.

The terrain between Lawrence and Topeka, similar to that between Lawrence and Kansas City, is sharply rolling. Location of the turnpike was influenced to some extent by the topography. Two interchanges each will be provided at Topeka, Lawrence and Wichita and one each at Admire, Emporia and El Dorado.

Wellington, south of Wichita, will be the site of an interchange and the southern toll station. The southern traffic terminus will be located at South Haven, just north of the Oklahoma border.

A modified cloverleaf-type interchange will be provided for the barrier toll station at Wellington. An ordinary barrier station will be used for collection of tolls at the east end of the facility. Except for the diamond type facility at South Haven and the special interchange designed for the eastern terminal in Kansas City, all other interchanges will be the trumpet type.

Excavating for one of bridge bents is a 38-B. The contract for the Kansas River Bridge substructure was let last December to the Massman Construction Company.

Six service areas will be located at approximately 30-mile intervals. They will be placed at a divergence between the two roadways and will be of two types. Three service areas will contain a restaurant, together with facilities for gasoline, oil and minor vehicle repairs. The other three areas will have coffee shops and service stations.

The route of the turnpike was divided into several topographic provinces for the purpose of investigations. They were defined as: Kansas Till Plains, Osage Plains, Flint Hills Escarpment and the Wellington Plains. These are separated by the valleys of three major rivers, the Kansas, the Neosho and the Arkansas.

With the exception of the Flint Hills, where some rock cuts would be encountered, and the area between Topeka and Kansas City, where the heaviest rock cuts were expected, no extraordinary construction problems were foreseen.

Current summary of excavation expected on the entire project shows more than 41 million yards of earth excavation, 6 million yards of rock excavation and 155,000 yards of bridge excavation. More than 35 million yards of embankment will also be required. Bridge concrete required amounts to 129,000 yards. Some 48,000 yards of concrete will be used on drainage structures.

A total of 702 adjustments will in-

Two workmen look out across five completed piers. Contract for building bridge approaches was awarded to List and Clark Co.

Carrying a 10-yd. bucket, a Manitowoc 4500 drops load into Euclid.

volve power lines, telephone and telegraph lines, gas lines, oil lines, water lines and sewer lines. There will be two major stream crossings. The Arkansas River Bridge near Wichita will consist of parallel superstructures using welded girders for a total length of 575 feet. The Kansas River Bridge, near Lawrence, will be 2,316 feet long. It is the largest structure planned on the turnpike. There also will be 31 minor stream crossings, 25 state and U. S. highway crossings, 176 county and township road crossings and 21 railroad crossings. Twin structures are being employed on all crossings carrying turnpike traffic to maintain the full median width across the structure and avoid convergence of the roadways. Vertical clearance above roadways will be 15 feet for all roads.

At this writing more than 170 contracts had been let and work was under way on grading and drainage, bridges, fences and some paving. About 230 miles of the 236-mile route were under construction.

The first contract, let to the Massman Construction Co., Kansas City, Mo., on Dec. 24, 1954, was for the Kansas River Bridge substructure near Lawrence and amounted to $795,588.30. Work began Jan. 13, 1955. The job is nearly completed.

Original design of the bridge was to include seven spans—four piers and two bents — but later the bridge was extended, adding two piers and one bent.

As with all other structures carrying turnpike traffic, the bridge across the Kansas River, or "Kaw" River as it is commonly called in the area, will be of twin structure design. The over-all length of the structure from the Santa Fe tracks west of the river to Highway 24 east of the river beyond the Union Pacific tracks is approximately 4,050 feet. This includes some fill between the highway and U.P. tracks. The bridge structure itself, from east of the Santa Fe tracks to the west bank of the Kaw river, is approximately 2,316 feet. Bridge height is above the record flood level for the area.

Bridge work began with erection of the west pier. To provide working area for construction of three of the four piers that are directly in the river, a fill dike was built from the west bank. Upon completion of the piers this fill was to be removed. The rest of the piers and the east bent were handled directly from the east bank. No additional fill was required.

Ice water, and lots of it, was the order of the day during *Excavating Engineer's* visit. With the sun pouring it on for record high temperatures all around the country, Kansas was not to

Reviewing contract details are A. B. Peters (right), superintendent, and Don Foster, assistant and foreman, for List and Clark. The job required 2 million yards of fill.

(Left) The Euclid unit prepares to deposit its heavy load on the fill area. (Right) A Caterpillar D8 dozer is spreading fill.

be outdone. One wag suggested that the famous Kansas wheat fields were turning into trays of burnt biscuits. Daytime temperatures on the scene remained well over 100°, but work was going steadily forward.

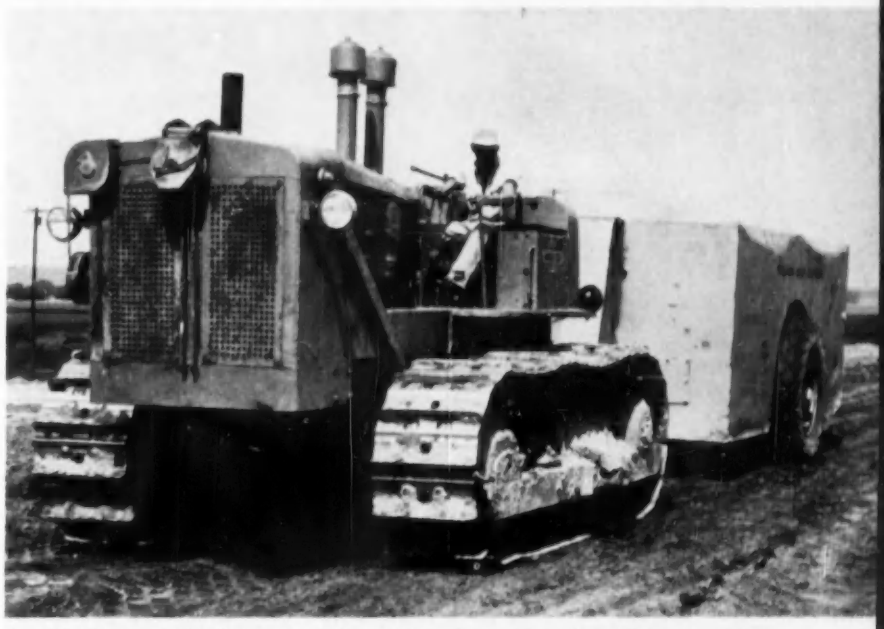
Cleaning up was going on around pier No. 6. Wood forms for pouring concrete had been set on pier No. 7. A Bucyrus-Erie 38-B with a Vulcan No. 1200-A extractor was pulling piles. Excavating on pier No. 8 was about to begin.

Build Cofferdams

Excavation for cofferdams, which went to bedrock at an average depth of about 50 feet, was handled by three Bucyrus-Erie 38-B machines equipped with 1½-yd. Blaw Knox clamshell buckets. Cofferdams for all river piers were 21-ft. 6-in. wide, 67-ft. 9-in. long and 45-ft. deep. Approximately 3,822 yards of Class I and 14,708 yards of class II excavation was required. Only one pier gave any unexpected trouble, excavation-wise, when old railroad rock fill, which went down to about four feet of bedrock, was encountered on pier No. 8. On the rest, clay and sand loam cover went about 20-ft. deep. Coarse sand was found the rest of the way.

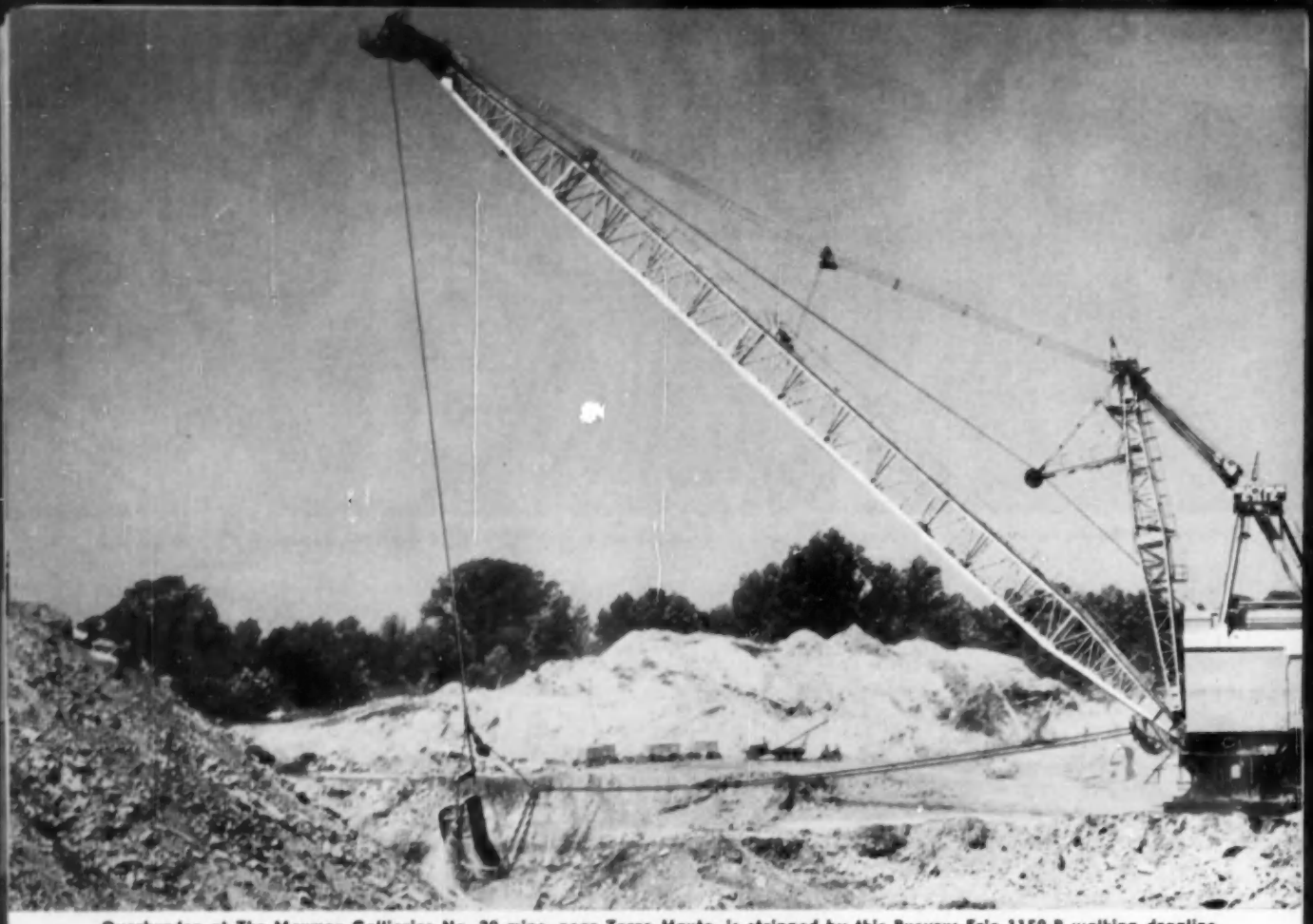
The cofferdams were constructed with the 38-B's, using a Vulcan 21 pile hammer on H piles and a McKiernan-Terry 9 B-3 on sheet piles. Approximately 60,000 square feet of sheet piling and 3,200 lineal feet of H piling were used. A Gorman Rupp 6-in. pump was used to dewater the cofferdams. Two com-

Continued on page 66



An Allis-Chalmers HD-20 tractor pulls a 50-ton Ferguson rubber-tired roller across the fill. Compaction of 100% was required 200 feet from each end of the bridge.

Massman officials include (from left) H. C. Zachau, Wes Hale and H. B. Webster.



Overburden at The Maumee Collieries No. 20 mine, near Terre Haute, is stripped by this Bucyrus-Erie 1150-B walking dragline.

Akremite: One Answer to High Blasting Costs

THE Maumee Collieries Co., Terre Haute, Ind., recently added to its long list of significant achievements with the development of the Akremite blasting process. The process employs an economical explosive consisting of commercial ammonium nitrate and carbon black, or other combustible material, packaged in polyethylene. With the Akremite process, Maumee has reduced its blasting costs to less than half the former figure, which represented approximately 20% of the company's operating costs.

Akremite, named for its co-inventor, Robert Akre, Maumee's superintendent of drilling and shooting, is prepared at Maumee's own mixing plant. The ammonium nitrate is mechanically mixed with an appropriate percentage of carbon black. The mixture is packed in tightly sealed polyethylene bags.

Not Cap-Sensitive

The process employs a combination of established principles long known to the explosives world. The explosive properties of pure ammonium nitrate with a moisture content of not more than 1½% have long been known. Although this material is not cap-sensitive and cannot be set off directly, when it is closely confined it is responsive to the detonation of an adjacent cap-sensitive primer charge. This primer charge provides the initiation.

Traditional methods of testing seemed to indicate that ammonium nitrate alone would not produce a blast potent enough for commercial purposes. It was also known that the explosive effect of ammonium nitrate could be intensified by the addition of an oxidizable material such as carbon black. The detonation of ammonium nitrate by itself releases a surplus of free oxygen. Carbon black or other oxidizable material present in a mixture with ammonium nitrate combines with this oxygen to increase the amount of explosive gas released. A stronger explosion is produced.

The Maumee Collieries Co. of Terre Haute, Ind., has hit paydirt in the development of an open pit explosive which greatly reduces the cost of blasting, yet is safe and effective.

Maumee's staff developed the explosive properties of ammonium nitrate as employed in the Akremite process to an effective point.

The exhaustive tests, in which more than 8 million pounds of Akremite were shot without a single miss, revealed the following:

First, it is economically produced. The ingredients—commercial grade ammonium nitrate and carbon black—are inexpensive. Transportation costs are low because the materials when shipped to Maumee do not bear the maximum first class rate applied to commercial explosives. Mixing is performed in an abandoned truck garage near the point of consumption. The actual weighing, mixing and bagging is a simple operation requiring only three men in the mixing room. Total cost for ingredients, manufacture and delivery to the work site at the mine is less than seven cents per pound.

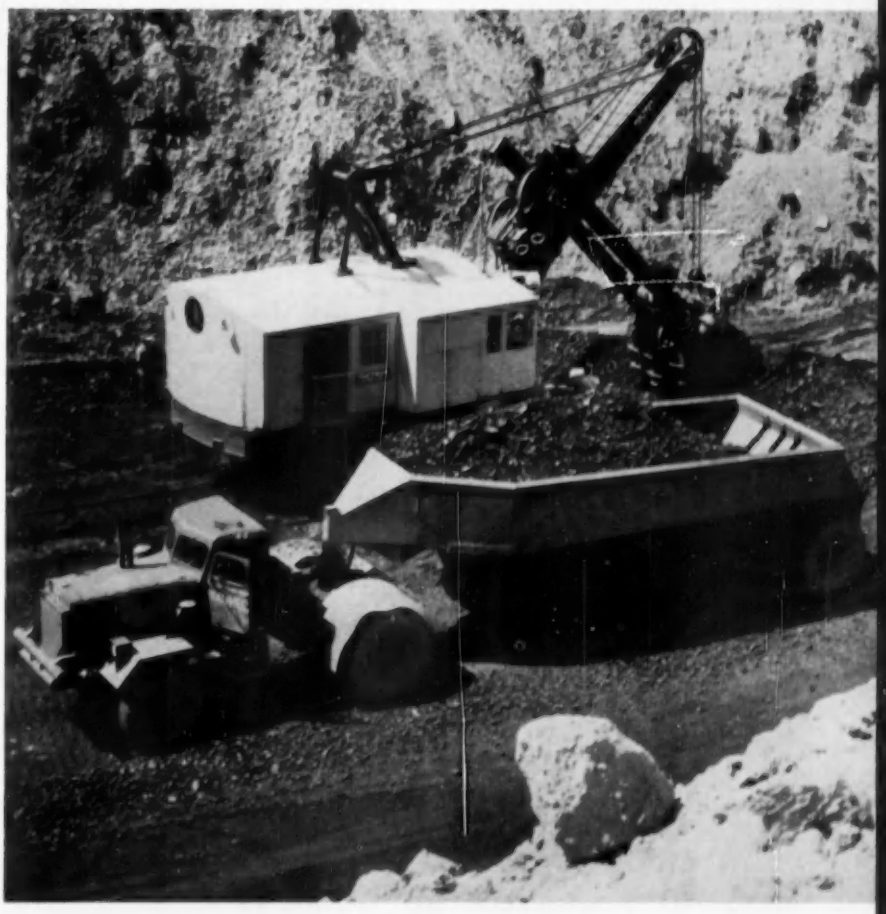
Second, Akremite is effective. It gives uniform fragmentation.

Third, because it is not cap-sensitive and must be fully confined under pressure to explode, Akremite is safe to handle. Although there has been little or no experience with missed holes, Maumee officials feel that in the event of misfire, Akremite could be dug up safely.

When bags of Akremite are dropped into a blast hole, the impact at the bottom of the hole causes them to expand to the diameter of the hole and fill it completely. According to Hugh B. Lee, president of Maumee, this ability to expand and fill the hole completely is responsible for good fragmentation when the charge is fired. There is no energy-wasting slap against the wall of the hole.

The Maumee Collieries Co. is one of the country's major coal stripping companies. It is one of the oldest strip mining organizations in the United States, dating back to 1911. Some 2,500,000 cubic yards of overburden are stripped each month at the company's five mines, four of which are equipped with Bucyrus-Erie 50-R rotary blast hole drills. All of the company's mines now use the Akremite process. The recent installation of the fourth 50-R drill enabled the company to convert the last of its operations to the use of the Akremite process. Previously, with wet drilling in an excessively damp formation, the Akremite process could not be employed because the Akremite bags had a tendency to float and would not expand to fill the hole when loaded in such wet conditions.

Development of the Bucyrus-Erie dry rotary blast hole drill helped inspire the development of the new explosive process. The 50-R offers several advantages: 1, drill hole cuttings cleaned from the hole by compressed air make excellent and economical stemming for blast holes; 2, as the 50-R bores into the ground, air-blown cuttings fill cracks in strata near previously blasted high-walls,



Working closely behind the big dragline is a Bucyrus-Erie 85-B shovel, shown here loading the uncovered coal into a 40-ton Dart truck for hauling to processing plant.

producing a "tight" hole; 3, a Roto-Clone precipitator picks up and handles dust, materially reducing the amount that can reach the operator's position; and 4, the holes are clean, smooth, dry and uniform.

Flexible Bag Used

Holes that are "tight, clean, smooth, dry and uniform" are considered desirable in the employment of the Akremite process because the bags must drop freely and then expand to fill the hole completely. When a 50-lb. bag 27-in. long and 9 inches in diameter expands to fill a 10⅛-in. hole, the bag becomes approximately 18 inches in length. The flexible bag provides a high loading density of Akremite in the bore hole. This eliminates a slap against the side of the hole at the initiation of the explosion. Instead, a sustained powerful push against the material to be blasted is developed, assuring uniform fragmentation throughout the area blasted. There is very little smoke liberated in the detonation and it is not toxic.

Visible in this close-up of the 50-R are one of its three leveling jacks, a No. 10 Roto-Clone for filtering the air and three "extra" drill rods, suspended in their holder.

This Bucyrus-Erie 50-R rotary drill works ahead of 1150-B, prepares blasting area.

AKREMITE CARTRIDGE SIZES BEFORE AND AFTER LOADING BLAST HOLES

Hole D Dia.	Weight of Cartridge	Diameter of Cartridge	Length of Cartridge	Length of Cartridge Loaded in Hole	Loaded Weight Per Foot Pounds
6"	25 lbs.*	5"	42"	28"	9.87
7"	25 lbs.	6"	34"	23"	13.44
8"	25 lbs.	7"	27"	18"	17.56
9"	50 lbs.	8"	40"	27"	22.23
10"	50 lbs.	9"	30"	20"	27.44
11"	50 lbs.	10"	27"	18"	33.20
12"	50 lbs.	11"	22"	15"	39.51

*Note that the 5-in. x 25-lb. cartridge at 42-in. length is perhaps too long to be successfully loaded. A 5-in. x 20-lb. would be better, as the length would be about 35 inches, or about 23 inches when loaded in the 6-in. hole.

At the Maumee No. 20 "Chieftain" mine, a 50-R was drilling holes to a depth of 32 feet the day of *Excavating Engineer's* visit. The depth drilled that day was almost the length of one drill stem—32¼ feet.

When more than one length of drill stem is needed, changeover is rapid. The operator selects an "extra" from the tool rack which holds four 32¼-ft. drill stems (the one in use and three in reserve, enabling the drill to go 130 feet down with tools conveniently carried on the machine). The rack arm swings a stem around and centers it under the rotary machinery where it is screwed on. Then, as the drill stem is raised out of its base socket, a trip mechanism releases a gate in the drill stem holder, allowing the drill stem to hang free so that the rack can be moved back out of the way. The bottom of the drill stem is then screwed onto the top of the tool string in the hole.

The business end of the 50-R is a Hughes Aero tri-cone rock bit. Three cone-shaped rotary bits turn on stationary pins extending from the sides of the bit body toward the center of the bit. There is one ball bearing and one roller bearing for each cone. Three ½-in. diameter holes in the bit body just above the cones serve as air passages through which compressed air is forced to clean cuttings and to keep the bit clean.

A cast-steel, heat-treated drill collar, fluted to provide a passageway for the air stream and for cuttings blown from the bottom of the hole, serves as a connecting tool between the drill bit and

drill stem. It likewise acts as a drilling guide for the bit. The length of service for a bit at the Maumee mines ranges from 5,000 to 9,000 feet of hole.

At the bottom of the operator's cab and just above the drill bit is a little trap door which the operator can open to observe the progress of the drill. The various layers of overburden through which the 50-R drills have their own colors. So, by noting the change in color of the cuttings which are forced to the surface, the operator can determine the progress of the hole.

In many cases the formation in a given hole changes and, unless the correct rotating speed is used, vibrations are set up in the machine. Ward-Leonard variable voltage control makes it possible for the operator to change the speed of rotation without stopping the machine.

Workman holds 50-lb. bag of Akremite he removed from the explosives cart. When the bag reaches bottom of hole, the impact will cause it to expand against the sides.

100 Feet Per Hour

The 50-R at Maumee's No. 20 mine replaced four 42-T's previously in operation with other types of explosives. The 50-R currently is drilling well over 100 feet of blast hole per hour. The maximum drilled at a Maumee mine with a 50-R was 1,325 feet in a 6¼-hour shift. This record was achieved with holes averaging 40 feet in depth, which indicates that one day's work accounted for approximately 33 holes drilled. The average footage drilled was 196 feet per shift hour.

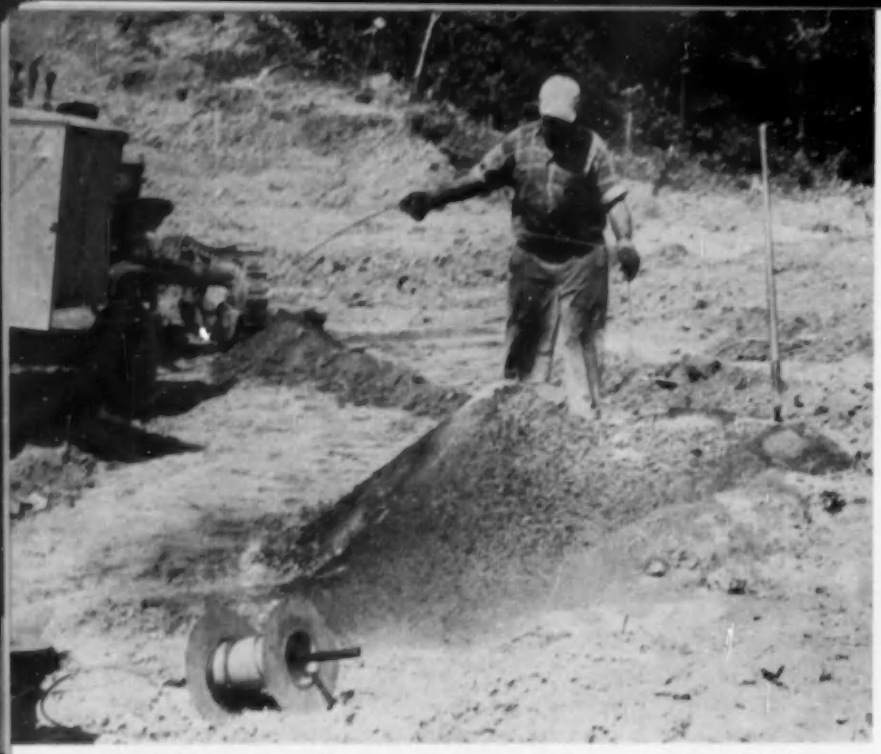
Maumee uses draglines exclusively for stripping overburden at its five mines. It is a pioneer in switching from shovels to large draglines. At No. 20 mine Maumee has a Bucyrus-Erie 1150-B walking dragline equipped with a 25-yd. bucket. Three buckets are provided for the dragline—one on the machine, a second nearby to use if a replacement is needed quickly, and another in the shop for overhauling. A bucket usually is used for three or four months before it is sent to the shop for rebuilding. Later, it is returned to the field to be held in reserve. A Maumee crew can change buckets in about two hours.

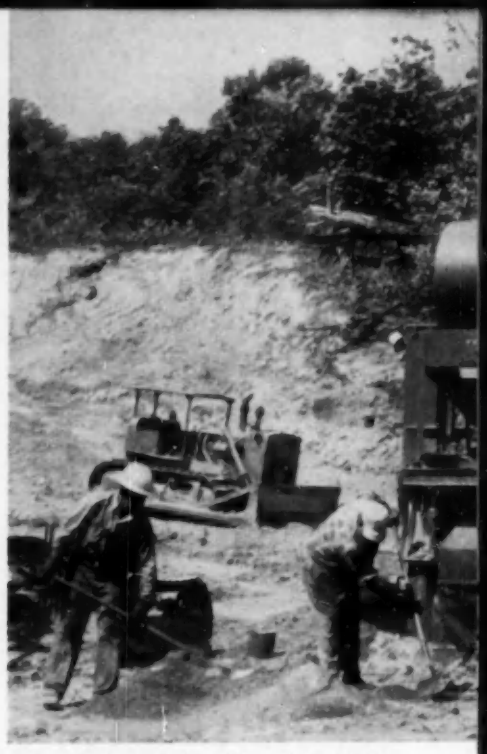
Primacord is tied to bag of primer before it is lowered into hole on top of Akremite. The primacord will set off this charge, which in turn will detonate the Akremite.

Maumee's No. 27 mine has a 1250-B with 30-yd. bucket and 200-ft. boom; No. 28 mine has an 1150-B with 25-yd. bucket and 180-ft. boom; No. 32 mine employs a 15-W walking dragline with 15-yd. bucket and 215-ft. boom; and No. 33 mine utilizes a 10-W with 10-yd. bucket and 185-ft. boom. All of these machines are of Bucyrus-Erie make.

After the overburden is removed, a Bucyrus-Erie 85-B loads the coal into trucks and it is taken to one of Maumee's four preparation plants. For hauling the company uses six 40-ton Dart trucks with power steering and automatic transmission. A seventh is held in reserve. The truck fleet handles 110 to 120 loads per 6¼-hour shift.

At the No. 20 mine, four Allis-Chalmers tractors—two HD-20's, an HD-15 and an HD-5—are used. An HD-20 tractor does a variety of jobs to relieve the load on the dragline. Road filling and leveling is handled by an HD-5. A Caterpillar RD-3 works around the loader. For "jack-of-all-trades" work, Maumee has an old army





After Primacord connection is made, primer is lowered into hole (left). Workmen (right) stem hole with cuttings from 50-R.

half-track which will pick up to three tons of material.

After the area is prepared, the 50-R drills blast holes, centered 27 feet apart in parallel rows 25 feet apart. Five explosives hauling carts transport Akremite to the blast holes. The carts can carry as many as 88 large bags of Akremite. For pulling the carts around the drilling area, Maumee uses a small Oliver crawler tractor, model HG-68.

In charging a hole with Akremite a single bag is dropped in first. A primer charge of a cap-sensitive explosive is then lowered into the hole by its Primacord connection; then four, five or six bags of Akremite, depending on the character of the overburden as shown by the drilling record, are dropped in on top of the primer charge. The 9-in. Akremite packages in a 10⅝-in. hole load eight pounds to the vertical foot; the required amount per hole is figured on this basis. There are 50 pounds of Akremite to the bag. The primer charge contains 20 pounds of a cap-sensitive explosive of about 60% weight strength packed in a polyethylene bag of the same diameter as the main charge. A smaller primer charge will detonate the Akremite, but the 20-pound charge has been found to be preferable on this particular operation.

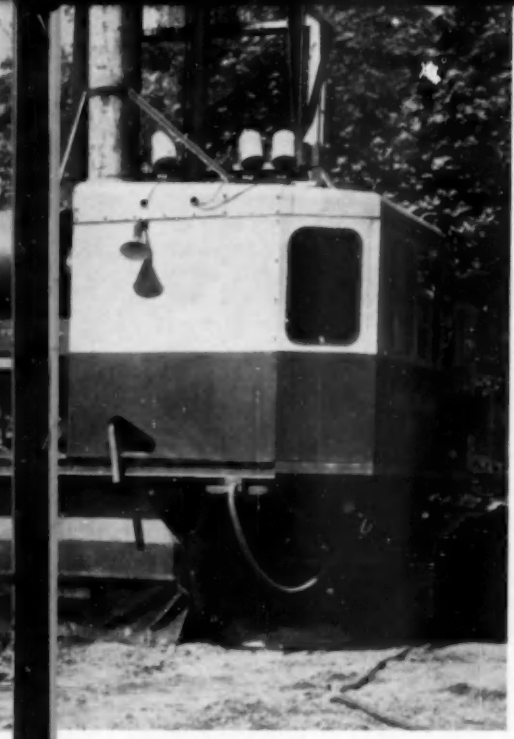
As many as 60 holes are set off in a single blast. The holes, in three parallel rows, are commonly connected with Primacord and Primacord "MS" connectors for delays. There is a 17-millisecond delay between holes in each row and 26-millisecond delay between rows. This assures progressive fragmentation from the beginning of the series in the general direction of the detonation of the holes. This pattern insures maximum efficiency of multiple blasts.

Now a word about the manufacture of Akremite:

Bags for containing the explosive are made by cutting 8-mil-gauge polyethylene tubing (from the Visking Corp.) into desired lengths, binding one end with a copper wire tie and then turning the bags inside out for filling. When filled, the bags are similarly tied at the open end with copper wire ties, leaving a bag-end a few inches long, convenient for handling.

Although Akremite is not cap-sensitive, every precaution is observed in the mixing room to avoid any possibility of accident. The mixing barrel, loading hopper and other containers are made of wood. No electrical connections are employed within the mixing room. The normal procedure in mixing Akremite is to pour into the mixing barrel 100 pounds of ammonium nitrate, con-

After the explosion, smoke indicates the exact area detonated. Akremite does not cause the overburden to spew, resulting in good fragmentation and a clean surface.



taining 33.3% nitrogen (which comes in polyethylene-lined bags from the Spencer Chemical Co. of Kansas City, Mo.). A weighed amount of carbon black of M-1 grade (supplied by the Vanderbilt Co.) is added, and the barrel is rotated about one minute to mix the contents thoroughly and secure homogeneity. From the mixing barrel the Akremite mixture is dumped into a portable wooden basket which transfers it by electric hoist to the bagging hopper. Here it is poured into polyethylene bags, resting on platform scales, to the weight desired.

After more than two years of experimentation and development of the Akremite blasting process, patent rights on the process were granted to Maumee Collieries in March of this year. To make the Akremite process generally available for the widest possible use in the mining industry, Maumee sold to the Du Pont Co., effective April 1, 1955, an exclusive license with right to sub-license under all of Maumee's United States and foreign patents and applications relating to Akermite. The following explosives companies have been licensed to date:

American Cynamid Co., Atlas Powder Co., Austin Powder Co., Illinois Powder Co., Independent Explosives Co. of Pennsylvania, King Powder Co., Owen-Mathieson Chemical Co., Pacific Powder Co., and the Trojan Powder Co.

These companies are prepared to manufacture and sell on a royalty basis. They also have the right to sub-license consumers to manufacture and use it on their own premises.

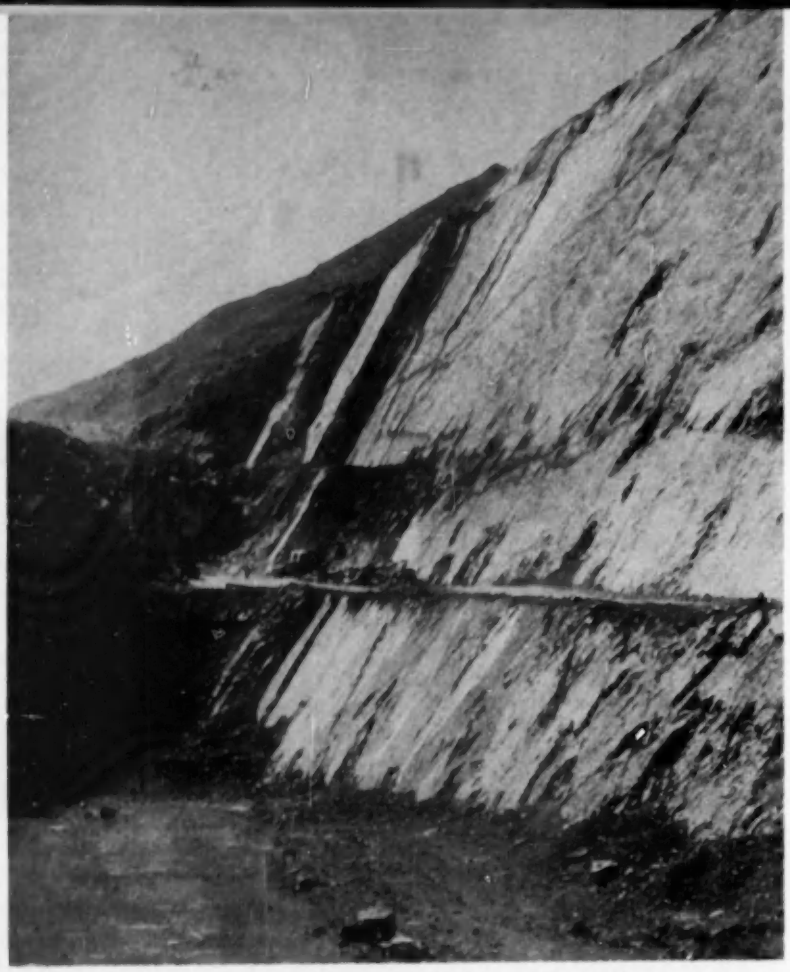
Several dozen widely scattered coal stripping companies have been licensed for their own manufacture of Akremite and use of the process. They are obtaining satisfactory results. The Akremite process is also being employed in shooting iron ore in Minnesota and Labrador.

Akremite is named for its co-inventor, Robert Akre, a Maumee superintendent.

Surface material is cleared away by an Allis-Chalmers HD-20 dozer. Later, the 50-R will move into the area. Canopy uprights are made from old wire cable sections.

Lime Plant Ups Efficiency

By Ray Day



High into the sky goes the sloping face of the Utah Lime & Stone Company's quarry. A 14-year-old Bucyrus-Erie 37-B shovel (background) loads material into truck.

A Gardner-Denver portable compressor powers a wagon drill which is starting a 2½-in. diameter hole in the face of one of the newer sites at Flux quarry site.

MODERN quarry methods, combined with sound production techniques in a lime manufacturing plant, are permitting Utah Lime & Stone Co. of Grantsville, Utah, to meet an expanding market with ease. To accomplish this, high explosives have been used on a sloping limestone quarry face approximately 200 ft. high. Combined with older loading and hauling methods, the new plan keeps approximately 600 tons per day moving away from the Grantsville quarry.

Utah Lime & Stone Co. has grown into a permanent industry in the Salt Lake City vicinity. Its daily production of about 600 tons represents an important contribution to several other industries around Salt Lake City. Sugar refining plants, for example, use crushed limestone in particles three to six inches in size. The sugar industry plants run the rock through their own lime-burning plants for two reasons—1, for the recovery of carbon dioxide gas in the rock, and 2, for the production of lime.

Utah Lime & Stone Co. also produces 1½ to ½-in. limestone particles, which it uses either to make its own lime or to sell to other lime manufacturing industries in the vicinity. A ½-in. minus crushed limestone product also is produced for use in coal mine dusting. The latter product is so graded that approximately 75% of the particles will pass the No. 200 mesh screen.

Two Sites Worked

Two quarry sites are operated by Utah Lime & Stone Co. Both are approximately seven miles west of Grantsville. The first site, known as Dolomite, is located as its name implies in a deposit of dolomite rock relatively low in lime content. The principal function of the Dolomite plant now is as a lime-burning site. Quarrying at Dolomite was active many years ago. Quarrying now is done about two miles east of Dolo-

mite where limestone rock containing 54½% lime and weighing approximately 86 pounds per cubic foot before burning is found. This high grade limestone is hauled to the Dolomite plant for reduction into commercial hydrated and unhydrated lime.

The Flux quarry site, where the high grade limestone is found, is the newest and biggest of the rock production locations. Strikingly divided limestone layers approximately 20 to 22-ft. thick stand up on end at approximately a 70° slope.

Five separate quarries have been opened at the Flux site. The biggest is approximately 350-ft. long and up to 200-ft. high. The quarry sites are operated so that while drilling and shooting are under way at one location, loading and hauling are being done elsewhere. It is a good production technique because it keeps men out of each other's way. It is also the safest way to operate what might otherwise be a dangerous quarry.

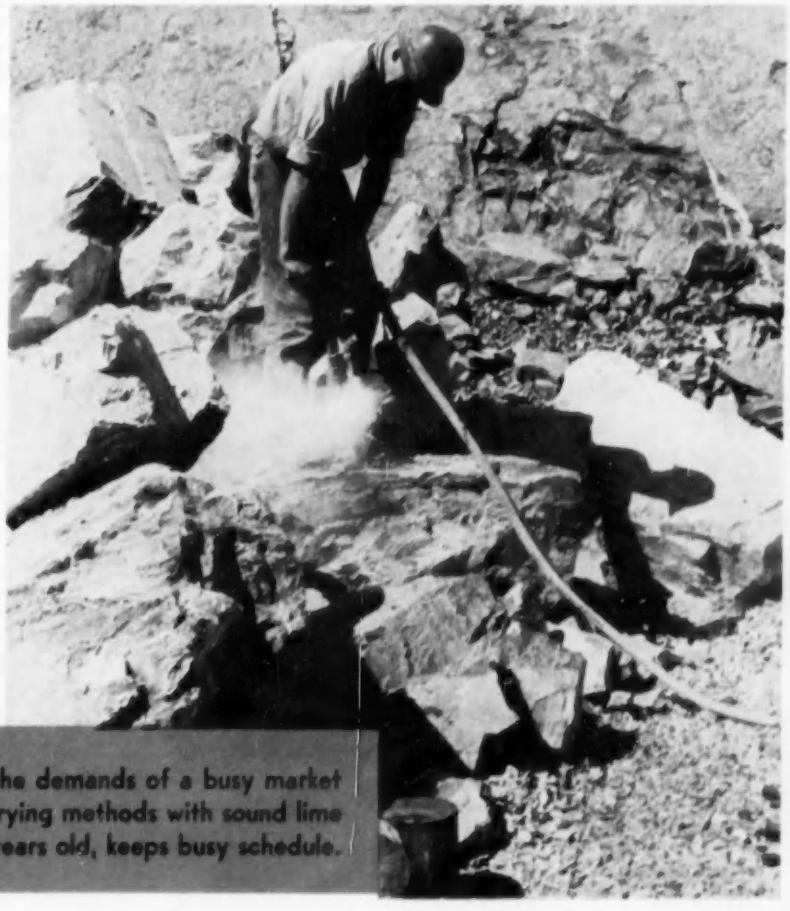
Drilling Innovation Used

A modern, interesting drilling technique was introduced sometime ago to get the limestone rock down from the high sloping face. The method has replaced two other ways conventionally used for vertical quarry faces. The coyote-hole method was tried without success. The cost of drilling vertical holes as deep as the full face would have been prohibitive. To cut into several thicknesses of the sloping rock would have produced a dangerous condition.

Company officials decided on an imaginative method of mounting a Gardner-Denver or Sullivan wagon drill inside a skid-mounted cage. The cage is pulled by winch truck from the toe of the slope all the way to the top. The winch truck cable operates through a snatch block fastened to several anchors set in solid rock well back from the top of the slope. The anchors consist of broken truck axles, set in jackhammer holes drilled in solid rock. By hooking the snatch block to a bridle, which in turn catches about three of these anchors, a safe method of supporting the cage was devised.

Drill steel in maximum lengths of 20

Drilling on face is done by placing drill in skid-mounted cage (above), which is pulled from toe to top by winch truck. Gardner-Denver drill (below) does secondary work.



Utah Lime & Stone Co. meets the demands of a busy market by combining new and old quarrying methods with sound lime burning techniques. Shovel, 24 years old, keeps busy schedule.

This 1½-yd. Bucyrus-Erie 37-B, shown loading broken limestone to a Ford truck, does major part of loading at the Flux quarry.

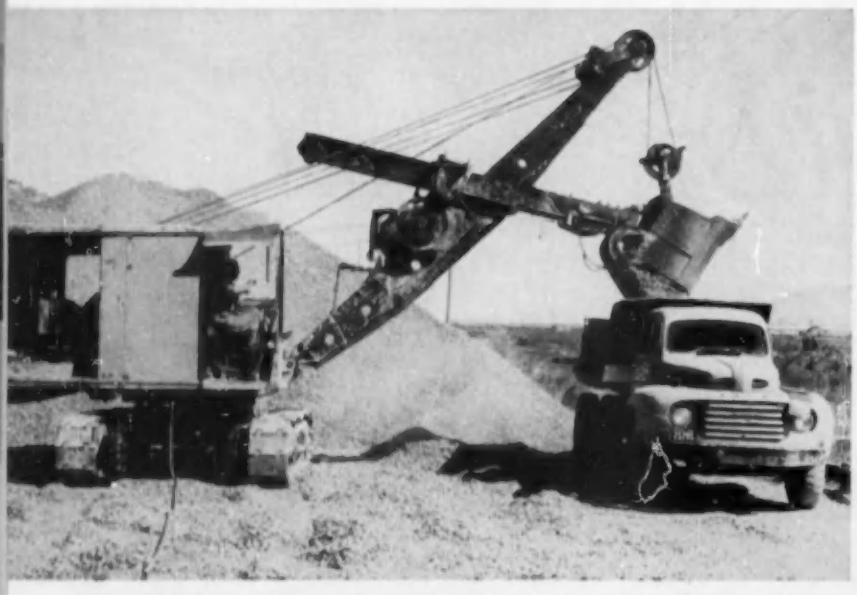
feet is used with Liddicoat throwaway-type rock bits. The limestone rock is not excessively abrasive. Drill footages up to 418 have been recorded on one bit at the Flux quarry site. Drill bit life averages about 100 feet per bit. The rock at the Dolomite location, however, is considerably harder, and drill footage was somewhat less there when that site was active.

Drilling is done rapidly. The cage-mounted wagon drill—built so that its floor will be level as it moves up the slope—sinks a bottom hole which reaches well into the toe. Only the toe holes are sprung; the others are column loaded. The drill cage moves up the quarry face by means of the winch truck, drilling perpendicular holes which reach into the next cleavage plane in the rock.

After a line of holes has been drilled to the top of the quarry face, the driller loads the holes with Hercules and Gold Medal bag and gelatin-type powder on the downward trip. An electric method of shooting is employed, hooking the individual hole detonator lines to a trunk line leading down off the cliff.

Three rows of drill holes usually are

To control dumping action of the 1035, the operator reaches to grab lever.



Believed to be the oldest steadily working shovel in the state of Utah, this 24-year-old Bucyrus-Erie Type 1035 machine is loading crushed limestone into a Ford F-7 truck.

put in for each shot, providing powder capacity to bring down from 5,000 to 7,000 tons of broken limestone in each blast. A staggered system of No. 1, 2 and 3 delays, so positioned that staggered shots tend to break into each other and add to fragmentation, is being employed. It has worked well and eliminated what otherwise would be a secondary drilling problem.

There are, however, approximately six jackhammers on the job. Also there is a portable Gardner-Denver air compressor and a portable Gardner-Denver wagon drill for special use, particularly in some of the smaller quarry sites. The main air supply is furnished by three 265-cfm Gardner-Denver air compressors. They discharge through an air receiver and furnish compressed-air power over approximately a mile of pipeline scattered between the several Flux quarry locations.

Reduction Process Begins

Broken limestone from the quarry face is being loaded out by a 1½-yd. Bucyrus-Erie shovel which was purchased in 1942. A fleet of Ford F-7 trucks, working under the shovel, hauls the material to a feeder trap, where the reduction process begins. The shovel operator does much sorting of broken limestone, using the dipper to kick out for secondary breakage any oversize fragments which he feels will not pass through the crushers in the reduction line.

The limestone rock is being reduced in size by passing it progressively through a No. 8 Allis-Chalmers gyratory crusher, a No. 7½ Allis-Chalmers gyratory crusher and a 10 x 30 Pacific jaw crusher. Screen decks are arranged between the various crushers with a view toward separating acceptable material as soon as it is finished. The other material is routed for further screening in closed circuit with crusher equipment.

A scalping screen below the No. 8 gyratory crusher takes out limestone fragments from three to six inches in size and dumps them over a waste conveyor to the "sugar pile." This supplies the sugar industry with its source of material. Any rock greater than six inches in size left in this rotary barrel screen returns to the No. 7½ Allis-Chalmers gyratory crusher for further reduction.

Other parts of the reduction system include Simplicity and Tyroc screen decks, arranged strategically to produce

Continued on page 67

(Above) Truck is at feeder trap, at right, at beginning of reduction process at Flux limestone reduction plant. Lime is processed and sacked at Dolomite plant (below).

Quarry Superintendent William Miller stands beside one of iron-wheeled wagons which was used in the operation years ago to haul hand-picked stone to screens.

International distributor delivers...

500 TD-24's

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Howard-Cooper Corporation, one of International's 31 Western area distributors, have just delivered their *500th TD-24!*

You see this big 200 bhp crawler already at work for Wooley Logging Company, Drain, Oregon.

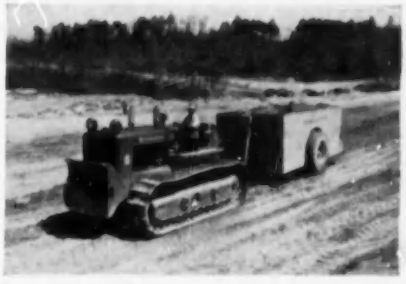
In rough, tough, Pacific Coast, big-scale logging, mining, and earthmoving, profitable production depends upon positive load-control, up-grade or down. *The TD-24 is the only tractor built that has planet-power steering—which gives you constant load control on both tracks when turning.* That's why the TD-24 out-produces the others so decisively, with dozer, arch, or scraper! Another big TD-24 advantage is its built-for-the-West construction. Records, on fleet after fleet, prove that TD-24's stand up under the toughest conditions—and consistently cost less for maintenance than any other make on tracks! TD-24 high-altitude performance is a big advantage, too—so is its seconds-fast, cold-weather starting and operating ease!

Oregon's 500th TD-24 is already at work. Here, it clears trees and stumps for a new, main truck-haul road near Brush Creek. "I like its torque converter," says Operator Dean Russum. "You get more power without track slippage and you no longer rough up the machine with shock loads."

TD-24's

6 for A. J. Orlando on Massachusetts Turnpike—Most of the tractor work on this Whiteside (N.Y.) contractor's 4.89-mile, 2,500,000-yard, $3,340,000 section of the Massachusetts Turnpike is being done by TD-24's. One pushing 3 scrapers accounts for 4,500 pay yards every 10 hours (scrapers on 1,500-ft. one-way hauls). Others pull rippers, level fills, etc.

If you're in the market for a big tractor, you owe it to yourself to check the leader . . . the International TD-24. Five-hundred owners in just one area have proved it their "Best Buy." If it can so successfully and so profitably lick the tough rock, cold weather, and mountain grades of Oregon, it can successfully and profitably lick your high-cost jobs, too! Let us prove its advantages with a demonstration. Call to arrange time and place.



PAY OFF ACROSS THE COUNTRY

6 for J. D. Armstrong on Kansas Turnpike—Of their 9 TD-24's, this Ames (Iowa) contractor reports all have run 5,000 hours or more before needing any repair work. Six on 1.7-mile, million-yard Turnpike section near Emporia, are towing 50-ton rollers, pulling and push-loading scrapers. On hauls of 700 to 2500 ft., they account for 5,000 pay yds. per day.

2 for J. W. Moorman on Buford Dam, Georgia—These "24's", two of the five now owned by Moorman, push-loaded scrapers or pulled 50-ton rubber-tired rollers, 18 hours every day for 18 months. On compaction, they averaged 180,000 cubic yards weekly for the 200-ft.-high, 1630-ft.-long main dam. Moorman's other TD-24's are used to push-load scrapers, and pull or push belt loaders.

3 stripping overburden for Meyer Bros., Pennsylvania—"Proven crawlers," says Partner George Meyer of his TD-24's. "We've used our 3 for 3 years now. They have good balance plus unmatched push power." Right now, rigs are removing 30 feet of shale and clay to uncover a 30-inch vein of bituminous coal. The 2 TD-24's do 80% of the job; a large shovel, 20%.

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CRAWLER TRACTORS
6 Models . . . . 40 to 200 hp

DIESEL, GAS ENGINES
10 Models . 16½ to 200 hp

ALSO: International Draft Loaders . . . International Scrapers, Bottom-Dump Wagons . . . and International Superior Pipe-Boom Tractors.

News from the Field

ASCE Names Needles

Enoch R. Needles of New York City was elected president of the American Society of Civil Engineers following a mail ballot among its more than 38,000 members. Needles is senior partner of Howard, Needles, Tammen & Bergendoff.

As president, Needles succeeds William Roy Glidden of Richmond, assistant chief engineer of the Virginia Department of Highways. Needles will serve one year.

Frank A. Marston, Boston, Mass., and Glenn W. Holcomb of Corvallis, Ore., were named vice presidents of the Society. Marston is a consulting engineer with the firm of Metcalf & Eddy. Holcomb is professor and chairman of the Department of Civil Engineering, Oregon State College.

New directors of the Society, elected for three year terms, are: Carey H. Brown, Scottsville, N. Y., an executive of Eastman Kodak Co., Rochester, N. Y.; Clarence E. Eckel, Boulder, dean of the College of Engineering, University of Colorado; Mason C. Prichard, Washington, D. C., executive vice president of The Foundation Co., New York; John P. Riley, director of development, New York City Housing Authority; R. Robinson Rowe, Sacramento, supervising bridge engineer, California State Division of Highways; Louis E. Rydell, chief engineer, Planning Branch, Corps of Engineers, Walla Walla, Wash.; and Prof. Robert H. Sherlock, Ann Arbor, of the Department of Civil Engineering, University of Michigan.

Grade Project Starts

Ten bridges will be constructed and tracks of the Boston and Maine Railroad will be raised 18 feet above present ground level in a $4,239,000 grade crossing elimination project now under way at Winchester, Mass.

The project, which will affect three miles of main line track, is being done for the Massachusetts Department of Public Works. C. J. Maney Co., Inc., Lexington, Mass., is the prime contractor.

A Lorain Crane is used to drive Foster sheet steel piling in lengths of 16 to 22 feet to support earth under railroad tracks on Massachusetts grade elimination project.

After temporary track was set about 50 feet from the regular roadbed, 500 pieces of L. B. Foster Co. DP2 steel sheet piling in lengths of 16 to 22 feet were driven to support earth under the new tracks while excavating for bridge supports is in progress.

Air-driven hammers were used to drive the piles through the rocky soil, which has a high ground water level.

The project is scheduled to be completed in May 1957. John Cunning is job superintendent.

British Fair Set

Heavy industry will have exhibits at Castle Bromwich, Birmingham, at the April section of the British Industries Fair, April 23 to May 4, 1956.

ARBA Meeting Set

Congressmen will be among speakers at the 54th annual convention of the American Road Builders' Association at Miami Beach, Fla., Jan. 11-14. The congressmen, along with key officials of the Bureau of Public Roads and other federal agencies, will discuss measures to improve the streets and roads of the nation.

The convention will have an enlarged exhibit of highway materials and supplies.

Beavers Plan Awards

Outstanding members of the construction industry will be honored at the first annual Beavers awards dinner at Los Angeles, Calif., Jan. 27.

The Beavers, an organization for the builders of dams, bridges and other heavy engineered construction projects in the western United States and Pacific Ocean area, was recently organized.

Four new directors of the Beavers were elected recently. They are: B. H. Mercer, president of The Fidelity and Deposit Co., Baltimore, Md.; Guy C. Kiddoo, vice president of the First National Bank, Chicago, Ill.; Edward H. Honnen, owner of the McCoy Equipment Co., Denver, Col.; and John M. Server, Jr., editor of the *Southwest Builder* and *Contractor*.

AGC Nominates Rooney

Frank J. Rooney, a Miami (Fla.) building contractor, was nominated for

president of The Associated General Contractors of America, Inc., for 1956 by the governing and advisory boards of the AGC at their midyear meeting in Minneapolis, Minn., this fall. Lester C. Rogers was nominated for vice president.

AGC members will vote on the nominees by mail during December. New officers will be installed at the organition's 37th annual convention in New York City Feb. 13-16.

Rooney is president of Frank J. Rooney, Inc. He currently is vice president of AGC. Rogers is president of Bates & Rogers Construction Corp., Chicago, Ill.

At its Minneapolis meeting, the governing and advisory boards considered several problems. Among highlights of the meeting, which was attended by nearly 4,000 representatives of leading construction firms, were:

1. A restatement of the AGC's vigorous opposition to day labor operations by agencies such as the Tennessee Valley Authority.

2. A recommendation that contractors make work assignments strictly in accord with the Procedural Rules of the National Joint Board for the Settlement of Jurisdictional Disputes.

3. A determination to seek defeat of legislation pending in Congress which would require general contractors to name their subcontractors for mechanical specialty work in bids on federal projects.

4. A recommendation that proposals for extension of the Davis-Bacon Act provisions to highway construction be vigorously opposed.

Asphalt Group Expands

A new district office of the Asphalt Institute will be opened at Albuquerque, N. M. The Asphalt Institute, national research and development center for the asphalt industry, now has 23 division and district headquarters in the United States.

The district engineer at Albuquerque, yet to be appointed, will serve the state of New Mexico and parts of west Texas.

Construction Conference Set

A national "Conference on Construction Operations," sponsored by the University of California at Los Angeles (UCLA), will be held January 27 and 28 in Los Angeles.

The conference will be an effort to stimulate progress in the scientific management of construction. The conference will be under the leadership of L. M. K. Boelter, dean of engineering at UCLA; his assistant, C. Martin Duke; and an advisory committee of engineers, educators and construction industry leaders.

Matters to be discussed, among others, include the magnitude of the construction industry, planning and programming a project, cost control, labor's role in tomorrow's construction, principles of operations analysis; communication—designer to constructor; work sampling and planning; and scientific management.

Four panel discussions during one afternoon of the conference will be directed to the building construction field man, the building construction office man, the engineering construction field man and the engineering construction office man.

Construction leaders from all over the country have been invited, including general contractors, construction engineers, project managers, superintendents, industry association leaders, labor representatives, engineering educators and the technical press.

Decher Heads APWA

Edward P. Decher was elected president of the American Public Works Association at the group's 61st annual meeting in Milwaukee, Wis., in October.

He succeeds Warren A. Coolidge, di-

This 25-year-old Bucyrus-Erie 41-B steam shovel loads out 1,200 tons of rock per nine-hour day at the Alabama Asphaltic Limestone Company's limestone mine near Cherokee, Ala. The Tuscumbia (Ala.) firm also employs three other 41-B's of this type.

This view of the 6,571-ft. Delaware River Bridge, looking east, shows workmen setting forms for deck on spans 13, 14 and 15.

rector of public works, Nashville, Tenn. Coolidge will remain on the board of directors as immediate past president.

Decher is secretary and purchasing agent of the Joint Sewer Commission, Newark, N. J., and is APWA Eastern Area vice president.

Nearly 2,000 persons attended the four-day convention, which featured a display of public works equipment and numerous technical sessions.

Moles Winners Named

Men from opposite sides of the country, Howard L. King of New York and Harvey Slocum of Alhambra, Calif., will be the 1956 recipients of the awards given annually by The Moles for "outstanding achievement in construction."

Formal presentation of the awards will be made at the annual Moles Awards dinner in New York Feb. 2. The Moles is a society of leading figures in the tunneling and heavy construction industry.

The awards go annually to one member and one non-member of the Moles. King is a Mole. Among former winners were Herbert Hoover, Robert Moses, Adm. Ben Moreell and the late Gen. Brehon B. Somervel.

King is vice president and chief engineer of the Mason & Hanger Co. He is an expert in compressed-air sub-aqueous tunnels. He has been an important figure in putting through many of the major underwater tubes serving New York City.

Slocum is considered the world's outstanding builder of concrete dams. He now is in India building the gigantic Bhakra Dam. He was general contractor's project manager for many of the largest dams in the United States, including Grand Coulee, Hetch-Hetchy, Madden, Friant, Davis and Bull Shoals.

Pike Bridge Progressing

Progress continues on the construction of the 6,571-ft. Delaware River bridge which will be the direct connection of the New Jersey and Pennsylvania turnpikes.

Large portions of the deck work have been completed on the eastern end of the bridge. Steel erection for the main span was scheduled for completion sometime in December.

The bridge will have a roadway width of 76½ feet, providing six lanes for travel. The center span will be 636 ft. long. The bridge will have a vertical clearance above mean high water of 135 feet.

The New Jersey Turnpike Authority and the Pennsylvania Turnpike Commission will share cost of the bridge.

Work also continues on the roadway and structures on the New Jersey side (east) of the bridge.

Form Engineering Partnership

The consulting engineering firm of George S. Richardson has announced the formation of a new partnership to be known as Richardson, Gordon and Associates.

Richardson, Gordon and Associates includes the offices of George S. Richardson; Richardson and Gordon; and Richardson, Morehouse, Ramsey and Fisher. The new name involves no change in personnel nor in types of work handled, it was pointed out.

Richardson, Gordon and Associates will specialize in bridge and express highway design. Major projects now under construction include the Delaware River Turnpike Bridge, a section of the Indiana Toll Road near Gary; the Downtown Interchange of the Penn-Lincoln Parkway in Pittsburgh; and the Fort Pitt and Fort Duquesne Bridges.

Also designed by the firm were the Braddock Ave. Interchange of the Penn-Lincoln Parkway; a 15-mile section of the Ohio Turnpike and the $17,000,000 Roosevelt Boulevard Extension in Philadelphia.

Industrial and commercial projects have included extensive work on mill

Continued on page 46

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MARION 43-M	1	22'-6"	16'-4"	100'-0"	*27	*35	—	1—1¼	415
MARION 362	1½	24'-8"	18'-2"	100'-0"	37	—	—	1½—2	398-D
MARION 372	—	—	—	100'-0"	43	—	—	—	—
MARION 83-M	2	24'-8"	18'-2"	120'-0"	60	—	—	2—2¼	414
MARION 87-M	—	—	—	140'-0"	75	—	—	—	—
MARION 93-M	2½	27'-4"	20'-0"	120'-0"	80	—	—	—	397-E
MARION 101-M	3	27'-4"	20'-0"	120'-0"	84	—	—	—	417
MARION 111-M	4	32'-0"	23'-8"	120'-0"	169	—	—	—	402-B

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Two International TD-24 dozers help build a 3.2-mile mountain field training road for U. S. Marines at Camp Pendleton, Calif.

News . . .

Continued from page 44

foundations and structures for U. S. Steel and Jones & Laughlin in various plants, including a huge ore loading dock and ship slip at U. S. Steel's new Fairless Works.

U. S. Engineering 'Wonders'

What are the seven modern civil engineering wonders of the United States? The American Society of Civil Engineers believes that they are (alphabetically):

1, Chicago Sewage Disposal System; 2, Colorado River Aqueduct; 3, Empire State Building, New York City; 4, Grand Coulee Dam and Columbia River Basin project, Washington; 5, Hoover Dam, Arizona-Nevada; 6, Panama Canal; 7, San Francisco-Oakland Bay Bridge.

The selections were made by a special committee of eminent members of the ASCE. Criteria set by the committee included service to the well-being of people and communities, pioneering effort in design and construction, uniqueness, beauty, size and, in some instances, the extent to which a project has been copied successfully. Not all criteria applied to all nominations.

The "Seven Wonders" program had its inception in the Society's Centennial Year, 1952. Local sections nominated more than 200 projects which, along with others, were considered by the special committee.

The committee was headed by James Kip Finch of New York, Dean Emeritus of the Columbia University School of Engineering. The other members were: Waldo G. Bowman, New York, editor of *Engineering News-Record*; Louis R. Howson, Chicago, a consulting engineer and vice president of the ASCE; Malcolm Pirnie, New York, of the American Institute of Consulting Engineers and the American Water Works Association and also a past president of the Society; Daniel V. Terrell, Lexington, dean of the University of Kentucky College of Engineering and past president of the ASCE; Ralph A. Tudor, San Francisco, a consulting engineer and former under secretary of the U. S. Department of the Interior.

The Seven Wonders of the ancient world were the pyramids of Egypt, hanging gardens of Babylon, Phidias' Statue of Zeus, Temple at Ephesus, Tomb of Mausolus, Colossus of Rhodes and Pharos Lighthouse at Alexandria. All but the pyramids have been destroyed.

Proper Maintenance Extends Cable Life

Last month, Excavating Engineer *presented an article on how to obtain satisfactory operation of heavy equipment, regardless of the intensity of the weather. Another maintenance article appears below. M. W. Dargel, assistant manager of the service department of the Caterpillar Tractor Co., Peoria, Ill., offers advice on how to extend the life of cables.*

Don't let cable breakage cost you time and money. Cable is normally considered an expendable part of a scraper or cable-controlled bulldozer. As with most expendable items, however, it is only natural to try to extend its usable life. This can be accomplished only by good maintenance practices and a good operator.

In most cases, an experienced operator can nearly predict how long the cable will operate before replacement will be necessary. He knows that cable breakage and down time can be reduced

to a minimum by correct operation of the cable control and daily inspections of the cable at the most common points of cable breakage.

Kinks, Frays Cause Breaks

The first place an experienced operator checks for cable wear is at the cable drum. Wear occurs more rapidly here because of the overlapping or "wiping" action of the cable as it wraps around the drum. This causes the cable to fray, and frayed sections or kinks in a cable are where it is most likely to break. If kinked cable is discovered during the daily inspection, the kink often can be straightened before severe damage results.

Kinking is caused by improper operation of the cable control which, in most cases, can be attributed to faulty adjustment of the cable control clutch and brake. Incorrect adjustment of these will allow excess cable to unwind from the drum.

Frayed cable is often the result of a bent or misaligned sheave or a sheave or ejector roller that is binding or not turning freely. Sheaves and rollers require lubrication to keep them rotating freely.

After installing new cable on a scraper, make sure that there are approximately two wraps of ejector-apron cable on the cable control drum when the scraper is at the extreme rear position with the apron down. With the bowl at ground level there should be five to six wraps of cable on the drum.

Where a drum is used to control a bulldozer, allow sufficient cable for at least four wraps around the drum when the blade is at ground level.

Keep Steady Tension

When lowering the scraper bowl to the ground or when setting the cutting edge for digging, do it with a positive action to keep the cable under tension.

The ejector normally will move the material out of the scraper rapidly. Don't overstress the cable, however, when moving sticky gumbo material. It's normal for some dirt to "hang up" on the cutting edge when unloading the scraper. The ejector can't go far enough forward to push it off. Again, don't overstress the cable. After unloading, let the ejector back by keeping the cable under tension.

As the apron is forced upward by the 'dozing action of the dirt when the bowl is being filled, take up the slack in the

Continued on page 68

ROGERS TRAILER DUO in 140 Ton Haul

The "know how" required for the moving and installation of heavy industrial products requires a knowledge of the characteristics and adaptability of the equipment used as well as the "tricks of the trade."

For the handling of this 140 ton transformer for the New York Consolidated Edison Company, Gerosa Haulage Company of New York, chose from their fleet of 20 Rogers Trailers these two 80 ton units.

The transformer was moved in by barge, picked up by a lighter derrick and placed astride the two Rogers trailers which hauled them to the power plant. An ingenious operation by master haulers and erectors.

By reason of repeated instances such as this over many years, Rogers Trailers are identified with a majority of such difficult and interesting heavy moves.

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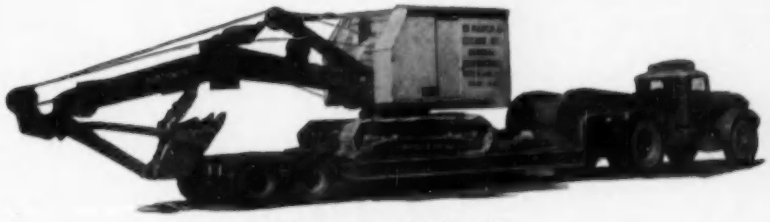

A Rogers Type "D" Trailer

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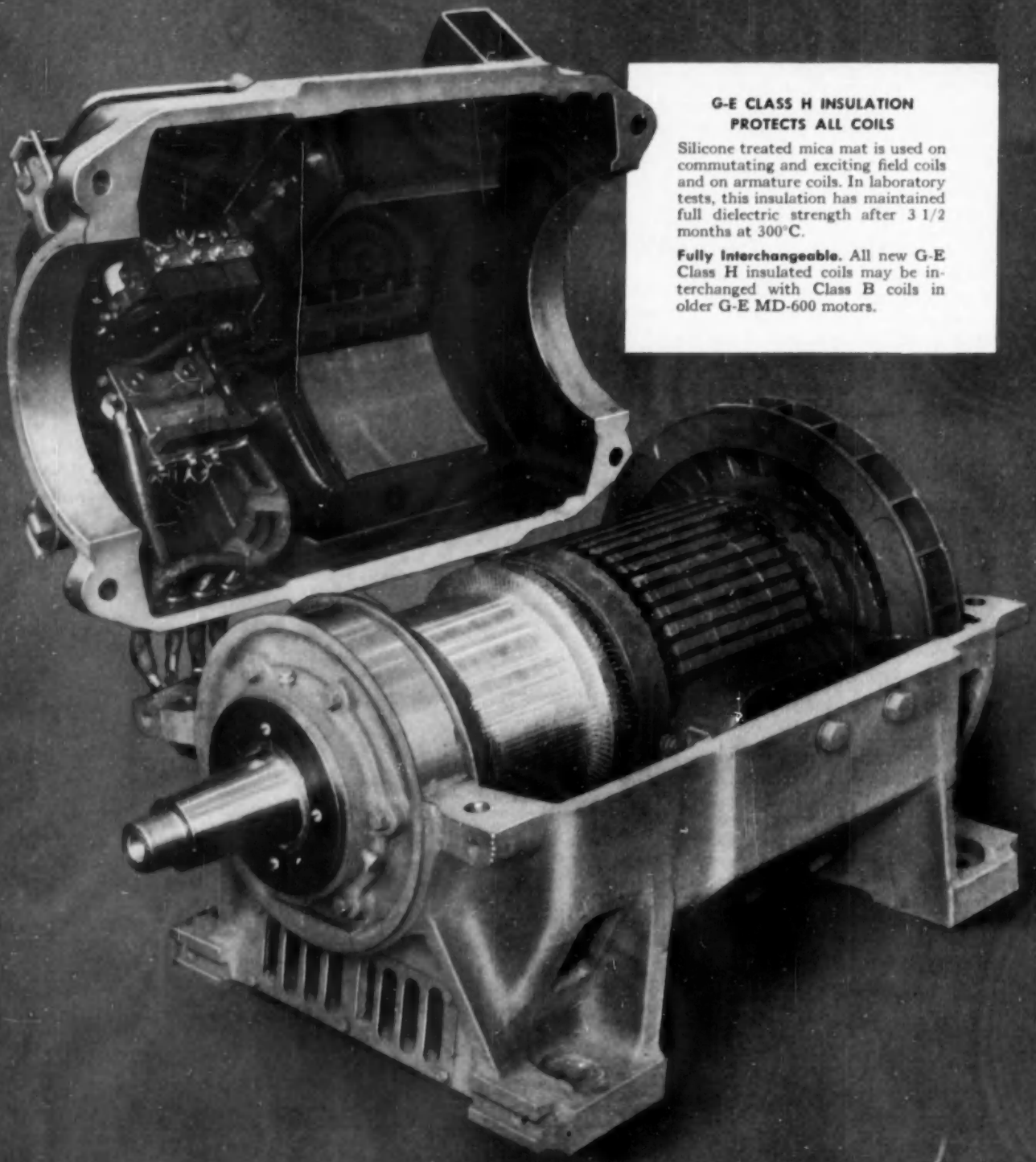
NEW G-E MD-600 MOTORS



G-E CLASS H INSULATION PROTECTS ALL COILS

Silicone treated mica mat is used on commutating and exciting field coils and on armature coils. In laboratory tests, this insulation has maintained full dielectric strength after 3 1/2 months at 300°C.

Fully Interchangeable. All new G-E Class H insulated coils may be interchanged with Class B coils in older G-E MD-600 motors.

Virtually Eliminated on . . .

WITH CLASS H INSULATION

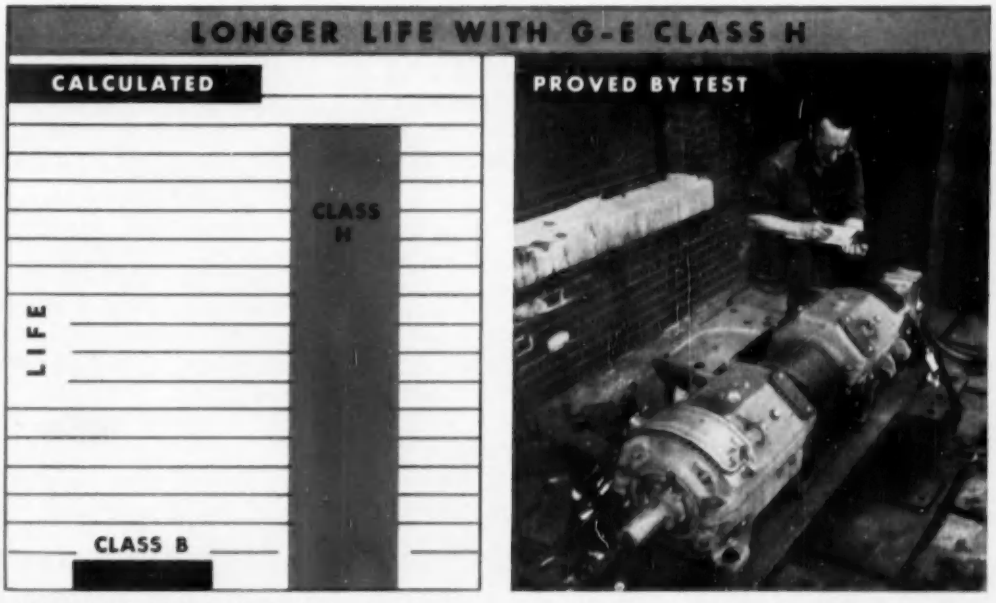
G.E. offers—in all MD-600's—Class H Insulated Coils

WHAT IS CLASS H? General Electric research has developed a combination of inorganic and silicone materials for a new insulation system now used in all MD-600 motors. These Class H materials will withstand temperatures up to 180°C continuously.

BETTER FOR HEAVY DUTY. Auxiliary mill motors often encounter unexpected high ambient temperatures, unforeseen extended duty or emergency conditions. Any one of these can cause "roastouts" from temperatures higher than the insulation capacity. The new G-E Class H insulation will resist up to 50°C more than Class B, resulting in longer motor service.

REWINDS ELIMINATED? On normal duty, insulation failure may be eliminated as the limiting factor in continuous armored motor service. Engineers calculate that each 10°C rise in temperature reduces the life of a given type of insulation by half. *Since G-E Class H will withstand 50°C higher than Class B, its life* **at the same temperature** *should be increased 2^5 or 32 times!*

YOUR G-E SALES REPRESENTATIVE HAS COMPLETE INFORMATION. Contact him at your nearby G-E Apparatus Sales Office, or write Section 812-1, Direct Current Motor and Generator Department, General Electric Company, Erie, Pennsylvania.



ENGINEERING STUDIES indicate that under identical operating conditions new G-E Class H insulated coils in MD-600 motors will last up to *32 times* as long as conventional Class B coils. Insulation failure may be eliminated as the limiting factor in continuous auxiliary mill motor service.

ACTUAL TEST with Class H and Class B motors coupled together *proves to date* the new insulation will last more than twice as long as the old. After burning out two Class B insulated motors, the one with Class H coils is still operating under exaggerated load, vibration and atmospheric conditions.

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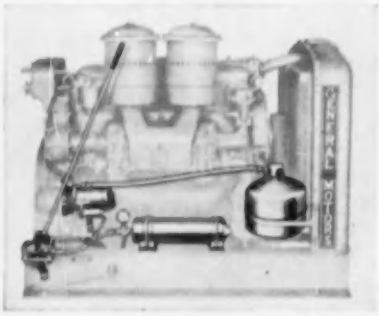


Manufacturer: Detroit Diesel Engine Div., General Motors Corp., Detroit 28, Mich.

Claims: General Motors has developed a new hydraulic starting system for diesel engines, which it says assures split-second starting even under adverse weather conditions. The unit is available for installation on new GM Detroit Diesel engines at the factory or on others already in operation.

The new system, called the General Motors Hydrostarter, eliminates many replacement and maintenance costs common to conventional starters. Its efficiency is not affected by temperature, humidity or altitude. In zero temperatures, for instance, the unit attains cranking speed almost instantly.

At the press of a lever, gas pressure built up behind a piston in a factory-sealed accumulator cylinder forces oil through a hydraulic starting motor. When the engine starts, an engine-driven pump forces the oil back into the cylinder, recompressing the gas; thus, the unit is automatically recharged for the next start.

The initial charge is accomplished by means of a hand pump. The unit then is self-sustaining, although the hand pump is available for recharging the cylinder if necessary. This pump also can be used to advantage in "rolling" the engine slowly to various positions when valve, injector or other engine adjustments are made.

Digging Tools Resist Sparks

Manufacturer: Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.

Claims: Ingersoll-Rand has announced a new line of paving breaker, demolition and digging tools for application in any plant handling such hazardous liquids as gasoline, naphtha, benzine and lacquers and flammable gases or dusts which could be ignited by a spark.

These tools are forged from a beryllium copper alloy, a material long known for its spark resisting properties and which has been used for years in cast tools for safety. I-R says that these tools have much longer life than their cast counterparts.

Rubber-Tired Tractor

Manufacturer: International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

Claims: International Harvester announces the International Model 300 Utility, a rubber-tired 42-hp wheel tractor for the industrial field.

Powered by an International C-169 gasoline engine, the tractor weighs 3,820 pounds. The added weight provides greater traction and stronger power train and axles, International engineers claim.

The Model 300 is available either in a standard five-speed transmission or torque amplifier drive. The torque amplifier gives 10 speeds forward from 1.5 to 16.7 mph and allows power changes up to 45% on the go without the operator touching throttle, clutch or shifting gears. With the torque amplifier, continuous power is supplied to drive wheels, even when changing tractor speeds.

Specifications of the Model 300 include: wheelbase, 75 in.; overall length, 118 in.; overall width, 59½ in.; clearance, rear axle, 19½ in.; front axle, 20½ in.; turning radius 9 ft. 8 in.

The Model 300 is available with a power take-off, completely independent or transmission driven, and a hydra-touch equipment control permitting front and rear-mounted attachments to be controlled simultaneously or individually.

More than 23 attachments applicable to the industrial field are available as optional equipment.

Portable Compressor

Manufacturer: Worthington Corp., Portable Compressor & Contractors' Tool Div., Harrison, N. J.

Claims: The Blue Brute 600′, an all-new portable rotary compressor, has been placed on the market by Worthington.

An easy-acting clutch allows operators to warm up the engine before cutting in the compressor. The fully self-draining compressor eliminates settling of oil and moisture in any low areas of either cylinders, inter-stage chamber or discharge point. A unique cylinder arrangement gravity drains all oil and moisture during shutdowns.

Additional features of the 600′ include two-stage oil separator, separate oil reservoir and air tanks and a shorter wheel base.

Two A-C Tractors

Manufacturer: Allis-Chalmers Mfg. Co., Tractor Group, Milwaukee, Wis.

Claims: Two new diesel-powered units—the 12,400-lb. HD-6 crawler tractor and the 19,600-lb. HD-6G tractor shovel—have been announced by Allis-Chalmers. The HD-6G has a rated capacity of 1⅓ cubic yards.

Features found in other crawler tractor models recently introduced by Allis-

Chalmers, including the HD-21, HD-16, HD-11 and HD-11G, are incorporated in the HD-6 and HD-6G. Included are the new A-C diesel engine with follow-through combustion; the wrap-around radiator guard; all-steel box-type "A" main frame; one-piece line-bored steering clutch and final drive

housing; straddle-mounted double reduction final drive gears mounted on tapered roller bearings; roller bearing truck wheels with 1000-hour lubrication; Tru-Dimension tracks; and extra long life ceramic master clutch lining.

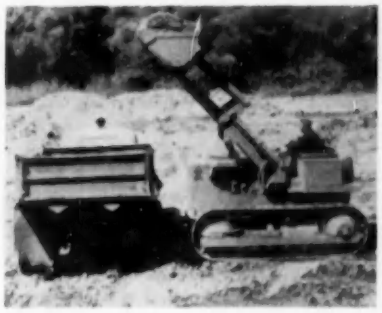
Both units have the Allis-Chalmers HD-344 diesel engine, a four-cylinder, four-cycle unit that develops 57 net flywheel hp, 45 hp at drawbar and 55 hp at the belt.

Maximum drawbar pull of the HD-6 is approximately 12,650 pounds. It has five forward speeds, ranging from 1.5 mph in first to 5.5 in fifth gear and 2 mph in reverse. The HD-6G has four forward speeds also from 1.5 to 5.5, and two reverse speeds at 2 to 4.1 mph.

Operator comforts incorporated into both new tractors include foam rubber seat and arm rests covered with weather-resistant plastic; tapered hood and narrow cowl; easy operating clutch levers and brake pedals that are conveniently located; and time-saving shift pattern. On the HD-6, daily lubrication has been eliminated on everything except normal engine care.

The HD-6 offers heat-treated track shoes; positive seal, roller bearing truck wheels, idlers and support rollers (1,000-hour lubrication); full width crankcase guard; muffler; 24-volt electric starting and lighting equipment; and front bumper.

The HD-6G also offers as standard equipment six truck wheels per side with 83 3/16 inches of track on the ground for maximum stability without use of counterweights; 1 1/2-yd., two position bucket; new type shovel hydraulic system with triple filter protection; semi-grouser track shoes; full truck frame guard equipment; heavy duty front idlers; pusher fan; and "Wrap-Around" radiator guard.



Special interchangeable equipment for the HD-6G includes rock, drag and light materials bucket; an angledozer and two bulldozer blades; crane hook; trench hoe; and lift, tine, and rock forks. Accessories include replaceable bucket teeth and a rear outlet from the shovel hydraulic system to operate other units such as scrapers and rippers.

Choice of 304 different buckets for Rehandling, Wide Rehandling, General Purpose, Hard Digging or Dredging

Why such a big choice?

So you can have the bucket that will fit your job whether it's rehandling sand or large pieces of limestone.

So it will fit your crane whether it's a small truck-mounted type or a big crawler.

So it will fit your present cable.

All these add up to 304 different possible combinations.

To select the proper size, weight and type bucket for the most efficient and profitable operation of your crane usually requires the service of a competent distributor's or manufacturer's sales engineer.

See your nearest Blaw-Knox distributor today.

Send for **BULLETIN 2254-R1**

BLAW-KNOX COMPANY
BLAW-KNOX EQUIPMENT DIVISION
Pittsburgh 38, Pa.
Offices in Principal Cities

BLAW-KNOX CLAMSHELL BUCKETS

BLAW-KNOX

A full line of matched mounted and drawn equipment engineered to the HD-6 is also available. Included are an Allis-Chalmers hydraulic angle and a straight blade dozer; ripper; power control units; winches; four-wheel scrapers; and log cart. Accessories include: tractor cab; canopy top; special track shoes; power take-offs; heavy-duty filters; heavy-duty truck wheels; heavy-duty idlers; heavy-duty truck frame guard equipment; logging guard equipment; hour meter; and numerous others.

Turbocharged Diesel

Manufacturer: Mack Trucks, Inc., 350 Fifth Avenue, New York, N. Y.

Claims: Mack has developed a new turbocharged diesel engine. Horsepower has been boosted from 170 to 205 without increasing the engine size or weight or losing fuel economy.

Mack engineers said that tests, on the basis of pounds of fuel per brake horsepower hour, indicated that fuel economy was even better with the turbocharged engine than with the naturally-aspirated type.

The power increase is effected by use of an exhaust-driven turbocharger in conjunction with the Mack Thermodyne diesel engine.

The Mack turbocharged Thermodyne diesel starts as readily as the naturally-aspirated version because it maintains the same compression ratio.

Much of the superiority of the exhaust-driven turbocharger lies in the fact that it is driven entirely by the waste energy of the exhaust and so robs the engine of none of its shaft horsepower. In addition, the amount of supercharge delivered, instead of being proportional to the speed of the engine alone, is proportional to the load on the engine.

The turbocharger has one moving part—the turbine wheel and air impeller. They are attached to a single short shaft. Neither requires close clearance. There are no gears and two bearings.

Exhaust gas enters the turbine at its periphery and escapes to the exhaust pipe and muffler at the center causing the turbine to turn at high speed. As the centrifugal blower is directly connected, it likewise spins, drawing air in from the air cleaner at its center and blowing it under pressure from its periphery to a connection with the intake manifold. For maximum efficiency, the unit is mounted directly on the exhaust manifold so that the travel of the exhaust from the engine is as short as possible.

The turbocharged Mack diesel is quiet and smokeless, except for a short puff at starting. The expansion and cooling of the exhaust before entering the muffler produces a quieter exhaust than in the naturally-aspirated type.

"Well, she's listed in the phone book as a foundation expert."

Truck Hoist and Winch

Manufacturer: Henderson Mfg. Co., Inc., Cedar Rapids, Iowa.

Claims: Hydraulic underbody truck hoist and winch units with double-action cylinders throughout are now being manufactured by the Henderson Mfg. Co., Inc. Low 25° angle of incline permits easier loading. The heavy-duty hoist is rated at 8 tons, and the heavy-duty winch at 8,000 pounds. The standard hoist and winch are rated at 6 tons and 6,000 pounds, respectively. Hoists and winches are available in proper lengths for standard truck lengths.

Tractor Modified for Mines

Manufacturer: Caterpillar Tractor Co., Peoria, Ill.

Claims: Caterpillar has modified its D2 diesel track-type tractor for use in non-coal underground mines. The United States Bureau of Mines has approved the tractor, with or without bulldozer. The modified D2 can be used with either a 24-volt starting system or a 250-volt starter. The 250-volt starter is of the plug-in type.

In pilot operation, a D2 tractor operating in the iron range near Hibbing, Minn., was tested. A similar D2 is working in a soda ash mine near Rock Springs, Wyo.

Because of the injection system of the D2's Caterpillar diesel engines, only a minimum of obnoxious gases is produced. After dilution, concentration of carbon monoxide gas was less than 0.01% by volume. Carbon dioxide and the oxides of nitrogen were diluted satisfactorily. These conditions were easily

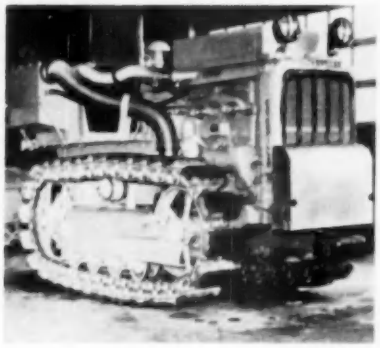
met by the D2 tractor's diesel engine and the exhaust gas dilution system.

National Mines Service Co. made the exhaust conditioner used on the approved D2. This conditioner was the only one approved for use. The conditioner, which also is used on the D4, lowers exhaust temperatures to 160° F and removes some of the water soluble aldehydes which are obnoxious to personnel.

Only water is used in the conditioner for operation. The water is gravity fed from a 20-gal. tank located on the hood of the tractor. After each eight-hour shift the water supply is renewed.

Stainless steel construction is used throughout the conditioner and its accompanying ducts and piping. Construction of this type makes the installation highly resistant to corrosion and vibration and prohibits escaping gases.

Exhaust gases from the D2 conditioner are piped underneath the tractor. On the D4, gases are piped in front of the radiator. The approved D2 uses a blower-type fan to accelerate exhaust gas dilution.



A fire extinguisher is included in this arrangement of the D2. The entire electrical system has all branch circuits protected with fuses.

Caterpillar will furnish prints and engineering assistance for modifying either the D2 or D4 tractors for non-coal underground mines. All modifications of these machines comply with Schedule 24 of the Bureau of Mines.

Twin Roll Crusher

Manufacturer: Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn.

Claims: Pioneer is manufacturing a new size of twin roll crusher, which it says will increase production 33⅓% over its smaller counterpart without a corresponding hike in cost.

Changing the roll setting to vary the

Continued on page 56

This is Philadelphia

an OWEN the predominant bucket in Philadelphia

(Photo used by special permission of the Philadelphia Bulletin.)

Yes, in Philadelphia nearly every contractor uses at least one Owen Bucket — some have several — for excavating — trenching — dredging — material handling.

Soon scores of Owens will dig the landscape and dot the sky in the building of Penn Center, Philadelphia's 22 acre 100 million dollar development.

Years of demonstrated superiority have also established Owen leadership in a majority of other prominent cities. And for rock handling the Owen Grapple is the popular unit.

AN ARMFUL AT EVERY GRAB

THE OWEN BUCKET CO.

6095 Breakwater Ave., Cleveland 2, Ohio

BRANCHES: NEW YORK, PHILADELPHIA, CHICAGO, BERKELEY, CALIFORNIA, FT. LAUDERDALE, FLORIDA

DIGGING or LIFTING . . .

Bucyrus-Erie Operating Features Help Speed Work

Powerful Crowd, Fast Cycles Speed Excavating

A positive crowd action that concentrates maximum digging force at the dipper teeth helps Bucyrus-Erie excavators load fast, even in tough material. Front-end design eliminates deadweight, puts strength where it's needed to withstand digging and swinging stresses.

Smooth-working, instant-acting controls let operators work with an easy rhythm to achieve high-speed dig-swing-dump cycles through an entire shift. Your Bucyrus-Erie shovels stay on the job with far less maintenance, too, because there are fewer working parts to wear out, and Individual Design matches each part to every other.

Accuracy and Stability Speed Crane Jobs

The operator of a Bucyrus-Erie crane has finger-tip command over every lift. Full-feel controls and independent boom hoist enable him to maneuver loads easily and with precision, while a wide crawler mounting and low center of gravity provide safe stability for handling heavy lifts. A correct balance of power, strength and weight contribute to best over-all operation. To save time on the job, boom inserts can be added in a matter of minutes, and jibs can be put on without removing guards, sheaves or suspension ropes.

See your nearby Bucyrus-Erie distributor for complete information on cranes and shovels of just the size you need. 174E55C

BUCYRUS ERIE

South Milwaukee Wisconsin

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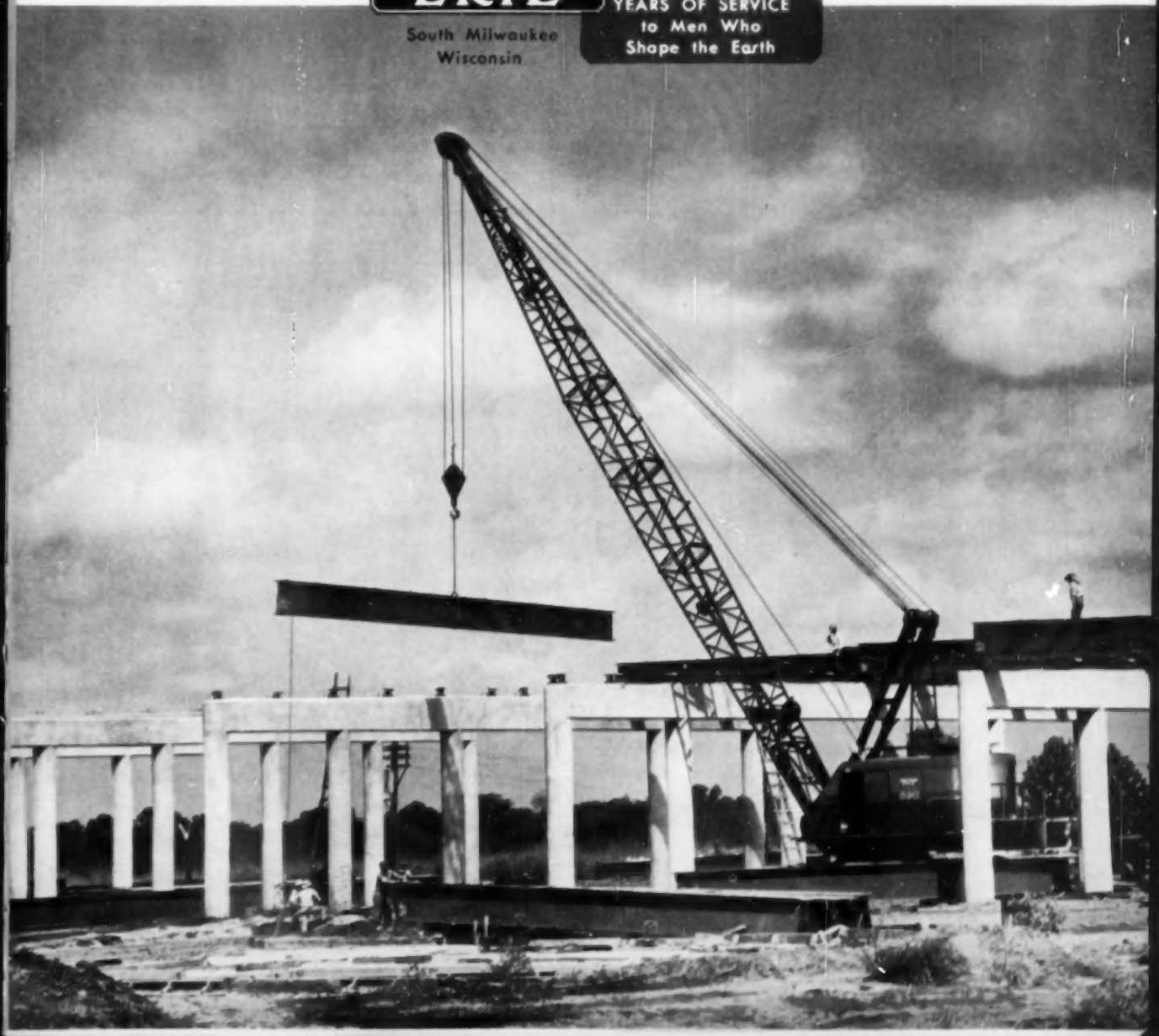
YEARS OF SERVICE to Men Who Shape the Earth

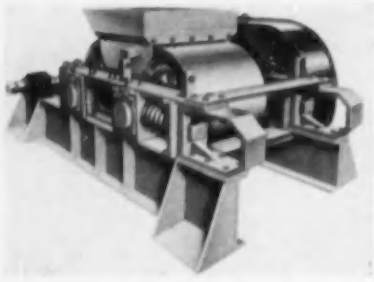


New Equipment . . .

Continued from page 53

size of the crushed product also will be easier because of a modification of design which incorporates a hydraulic jack and shim adjustment mechanism.

The new crusher has rolls 30 inches in diameter and 24 inches in width.



Capacity of the 30 x 24 crusher runs up to 254 tons of minus 2¼-in. aggregate per hour, based on material weighing 2,700 pounds per cubic yard. Maximum feed size is 4½ x 4½ in. when using low corrugated rolls. Overall dimensions of the new unit are 8 ft. 6 in. long, 6 ft. 10 in. wide, 53½ in. high; weight, 11,200 pounds. Its power requirements are in the 85-105 hp range.

Diesel Electric Plant

Manufacturer: Kohler Co., Kohler, Wis.

Claims: Two new 35KW electric plants are now being produced by the Kohler Co.

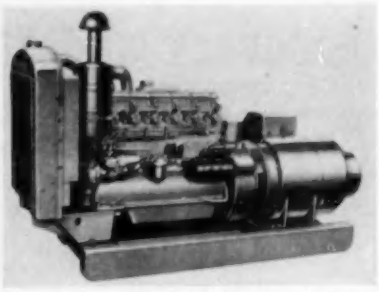
One of the plants has a rated capacity of 35,000 watts of alternating current and is diesel-powered. It is recommended by the company as a source of sole supply for construction projects, off-shore drilling rigs and similar heavy-duty uses. The other new unit also produces 35,000 watts of alternating current and is powered by gasoline.

All models in diesel and gasoline driven units feature remote-controlled, electric starting by on-off switch at the plant or two-wire remote control. Starting panels are equipped with over-cranking protection. The units are electrically cranked through automotive-type starting which uses a 12-volt starting battery. Wall mounted transfer switches for automatic stand-by operation are available for both the gasoline and diesel models.

Standard equipment on all models includes low oil pressure cut-out, high water temperature cut-out, oil pressure gauge, fuel line, muffler, battery cables and lubricating oil filter.

The diesel-powered models are equipped with a Waukesha Model 195 DLC 6-cylinder, liquid-cooled engine with 4-in. stroke and bore. They develop 75 hp at the governed speed of 1,800 rpm.

Optional accessories with all models, in both the diesel and gasoline units, include radio shielding, two 6-volt starting batteries, 55 or 100-gallon fuel tank with fittings and vent pipe, load control panel for automatic starting,



vibro dampers, and transfer switch for automatic stand-by service. A chevron priming system is also available optionally with diesel models.

Introduction of the new units increases the range of all models in the Kohler electric plant line from 500 watts to 35 KW.

Dozer Blade Rippers

Manufacturer: The Ransome Corp., 2729 Hunting Park Ave., Philadelphia 29, Pa.

Claims: Two new rippers—the R-78 and the R-46—have been introduced by Ransome. They are designed to fit tractor-bulldozer blades of any make and can be used for such operations as ripping frozen ground, rail roadbeds, road shoulders, shale, rock, asphalt, bel-

Buy and use Christmas Seals . . .

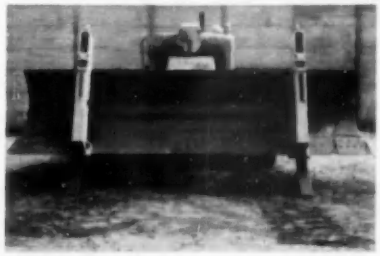
Fight Tuberculosis!

"Oh! Oh! You know what this means. Who's gonna buy the first round?"

gian block pavements and removing tree stumps.

The R-46 was specifically designed for Caterpillar 4A, 4S, 6A and 6S blades and can be adjusted to any blade from 27 to 38 inches in height. It can be adjusted for ripping depths of 6, 10, 14 and 18 inches.

The R-78 was specifically designed for Caterpillar 6S, 7A, 7S, 8A and 8S blades and can be adjusted for any blade from 35 to 48 inches in height. It can be adjusted for ripping depths of 6, 12, 15 and 18 inches.



The Ransome ripper features a removable ripping tooth and a one-man rack and pinion depth adjustment. Multiple units can be mounted in any position on the blade. The ripper has a welded box construction of heavy duty steel.

Large Payloader

Manufacturer: The Frank G. Hough Co., 708 7th St., Libertyville, Ill.

Claims: Hough has announced a new and larger two-wheel-drive Payloader tractor-shovel, the Model HAH.

The new model, which has a struck capacity of ¾ cubic yard, and a heaped capacity of 1 yard, incorporates all of the features of the smaller HA model which was introduced last February.

The bucket breakout action permits 40° of tip-back at ground level. The

HAH has a breakout force of 4,500 pounds, a lift capacity of 4,000 pounds and a carrying capacity of 3,000 pounds at 4 mph.

Especially designed for stockpile work, the HAH has a short turning radius and rear-wheel power steering; it has a high lift of 7 feet 9 inches.

Torque converter-drive and four-speed full-reversing transmission are combined with a gasoline engine developing 57 hp. Travel speeds range from 0 to 14 mph in forward and from 0 to 23 mph in reverse.

The new bucket arm design contributes to operator safety and permits carrying heaped loads at a lower level. Stability is improved through use of a hydraulic accumulator which absorbs load shocks.

The HAH has a mechanical parking brake which operates off the drive shaft.

A sealed and pressurized hydraulic system has been incorporated. Double-acting rams operate the boom arms and bucket.

Forward-Tipping Bucket

Manufacturer: Ernest Holmes Co., Chattanooga, Tenn.

Claims: Holmes has introduced the Holmes forward-tipping bucket, which permits the Holmes-Owen truck loader to be used as a loading unit for other trucks.

Addition of the hydraulic forward-tipping bucket makes possible a unit that may be used for digging, grading, self-loading and for loading other trucks.

The new bucket is hydraulically operated by controls located inside the cab, on the steering column. The bucket is constructed with a pivot at each end, near the bucket's center of gravity. The pivots are mounted in bearings which are at the end of each arm, thus allowing the bucket to rotate. The bucket is powered by two double-acting cylinders mounted on the top side of each bucket arm. The piston rods are connected to bell cranks mounted on the bucket operating shaft. The operating shaft extends the full length of the bucket.

The bucket may be rotated to any position up to 120°. This feature enables the operator to lower the digging edge of the bucket to get a better bite into the material, or to rotate it for better filling before dumping. The bucket is easily controlled and can be rotated quickly either forward or backward for loading or dumping.

The unit has the capacity to lift ½ yard of material per bucket. It can be installed on most 1½ to 2-ton trucks with any standard type dump body.

Portable Earth Tamper

Manufacturer: Jay Corp., 168 Hosack St., Columbus, Ohio.

Claims: Jay has announced the development and production of a new vibrating portable earth tamper. It is small enough to be carried in the trunk of a passenger automobile.

The Jay tamper is completely self-propelled. It travels 60 to 75 feet per minute while delivering impacts with more pressure per inch than a 10-ton roller.

It is a self-contained unit requiring no air compressors. It is operated by one man. Powered by a 2½ hp Wis-

Continued on page 59

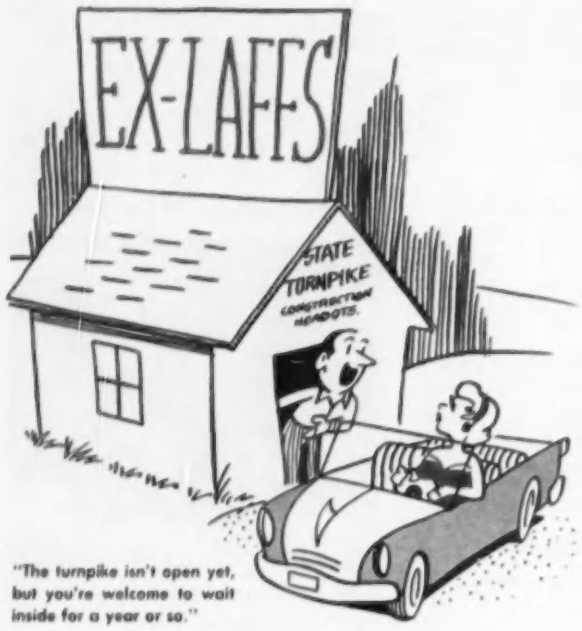
In a Hayward, there's no contact between the closing mechanism and the gravel or other materials handled. To be sure—this "no contact" feature is only one advantage. But a very important one to you—since it means much less wear, reduced upkeep, and a significant dollar-saving in bucket maintenance.

The Hayward Company, 50 Church St., New York 7, N.Y.

HAYWARD BUCKETS

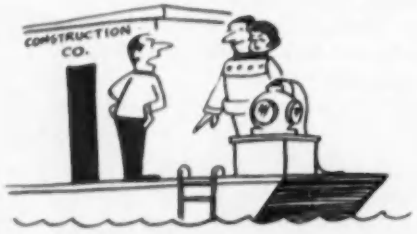
CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES

famous for performance since 1888



"The turnpike isn't open yet, but you're welcome to wait inside for a year or so."

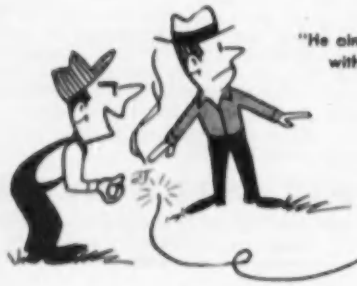
"That dirty bum! probably will keep us up here a couple hours. Wait 'til I get my hands on him."



"Since when do you need a secretary?"

"One n[illegible] hour I rested in a section of pipe to get out of that Texas sun."

"Now that's funny, my men stopped their machine and ran for the hills."



"He ain't going to bawl me out without a good reason."

New Equipment . . .

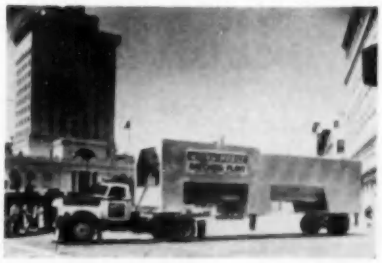
Continued from page 57

consin air cooled engine, the Jay operates eight hours on two gallons of gasoline. A special shock absorber, mounted between the handle and tamping chassis, combines with soft, sponge rubber handle grips to minimize vibration travel to the operator.

The Jay Tamper keyseats all materials to a solid foundation in any type of backfill. A flush shoe permits tamping up to abutments. The vibrating principle eliminates "sinking" problems on sewer fills and road work.

Tamping shoes of 12, 18 and 24 inches are easily interchanged.

Wheeled Batch Plant



Manufacturer: Noble Co., 1860 Seventh St., Oakland 20, Calif.

Claims: Noble is manufacturing what it calls "the first batching plant on wheels." Known as the Noble-Mobile, the ready-to-operate plant drives the highways to the job site within legal limits. The new plant requires no footings, crane or electrical wiring. It utilizes bulk cement. The aggregates are charged with scooploader, conveyor or clamshell. Output to truck mixers is 60 yards or more per hour.

Mobile Two-Way Radio

Manufacturer: Motorola Communications & Electronics Div., Chicago, Ill.

Claims: New mobile radio equipment has been announced by Motorola under the name of "Twin-V." This complete, new line of mobile two-way radio units stresses universal operation from either a 6 or 12-volt battery and incorporates major innovations improving receiver sensitivity, noise suppression and voice frequency reproduction.

Improved fringe area reception is obtained through the use of new circuits and new tube types. The matched speaker enclosure and cone provide frequency response characteristics which yield improved intelligibility in two-way radio voice reproduction.

The new line includes 6/12 volt DC dynamotor powered models, as well as the all-vibrator versions. Equipment is offered with all standard power output ratings for operation in the 25-54 mc, 144-174 mc, and 450-470 mc bands. All radio drawer units are universal in operation from either 6 or 12 volts.

Hydraulic Hose Line

Manufacturer: Aeroquip Corp., Jackson, Mich.

Claims: The addition of a new high pressure flexible hose line, capable of withstanding unusually severe surge

1-cu. yd. Sauerman Slackline Cableway began operations in 1921.

Company expanded output with this 2-cu. yd. Sauerman Slackline Cableway in 1948.

Minnesota Gravel Producer Gives the Facts on Recovery with Slackline Cableway

Guaranteed Gravel and Sand Co.'s 2-cu. yd. Sauerman Slackline Cableway, installed in 1948, replaced a similar unit of 1-cu. yd. capacity. Combined service of these two machines adds up to over 33 years company experience in the mechanics and economics of underwater recovery with Sauerman Slackline equipment.

Management of the Minnesota operation believes that a slackline has many definite advantages where the inhaul is long and the material is below water. Faster than other types of equipment, the company capitalizes on the slackline's speed over a maximum inhaul of 700 ft., with an average of 250 to 300 ft. A shift can be made in about an hour, if the material suddenly falls off, and it is possible to recover from depths exceeding 100 ft.

Due to the height from which the material is discharged, the slackline cableway readily lends itself to stockpiling. The surge pile can be built to a height of over 60 ft. This makes it possible to operate during periods when the river end of the plant is idle, thus averting complete shutdown such as might well occur if other types of recovery and stockpiling equipment were used.

The present slackline is operated by a Sauerman Roller Bearing Hoist, driven by a 6-cylinder diesel. The 80-ft. mast is so located that the effective height above water level is approx. 95 ft.

(For full information contact Sauerman Bros., Inc., and request Catalog C., Slackline Cableways.)

SAUERMAN BROS. INC.

622 S. 28th AVE. | BELLWOOD, ILL.

peaks in industrial hydraulic applications, has been announced by the manufacturer.

Available in ⅜, ½ and ¾-in. sizes, the new hose will perform satisfactorily at 5,000-psi operating pressures in the ⅜-in. size, and at proportionate pressures in the larger sizes. The two larger sizes use the company's standard detachable, reusable fittings, while a special socket has been designed for the ⅜-in. hose line. The new hose will withstand surge pressures 15 to 20% higher than the company's standard high pressure hoses.

Big Hyster Winch

Manufacturer: Hyster Co., 2902 N.E. Clackamas St., Portland 8, Ore.

Claims: Hyster announces the availability of "the world's largest towing winch" of matched design for the Caterpillar D9 tractor. The winch, the Model D9A, develops a line pull of 76,000 pounds; Hyster's previous most powerful winch, the D8D, has a line pull of 60,600 pounds.

The unit has a constant mesh transmission, flexible cable controls, built-in

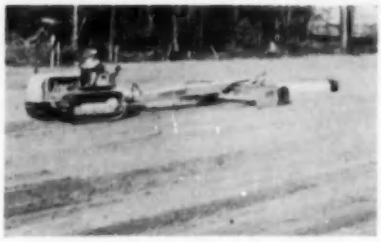
drawbar, cast alloy-steel drum, 15-in. brake, hardened gears throughout and brake compartment sump. An automatic brake is available as optional equipment. Its net weight is about 3,250 pounds. Barrel diameter of the drum is 16 inches; flange diameter, 27 inches; and barrel length, 11 inches. The cable capacity is 269 feet of 1⅛-in. line or 217 feet of 1¼-in. line. The D9A is available in two versions, one for the direct drive Cat tractor, the other with alternative intermediate gear train to suit the D9 torque converter model.

Hyster also announces the production of two new logging arches: the Model 98 with tracks and the Model 98R with rubber tires. Both are designed for heavy duty logging operations with either Cat D9 or D8 tractors.

Ground Leveling Plane

Manufacturer: Raymond A. Gurries Mfg. Co., San Jose, Calif.

Claims: Gurries has announced a new 50 ft. plane, the GP-50, with a 10 or 12 ft. bowl. The plane features an automatic hydraulic leveling method which holds the machine and rigid blade on a straight line from front to rear. The carrier wheels automatically raise and lower to follow the contour of the ground while the bowl is held level.



The GP-50 can be collapsed to a transport length of 30 feet 8 inches. It can be pulled by tractors of 35 hp and up, with a hydraulic system of ᵥ to 40 gpm.

Approximate capacity of the GP-50 with the 10 ft. bowl is 3⅓ cubic yards; capacity for the 12 ft. bowl is four yards. Pulled by a tractor at 3 mph, the GP-50 with 10 ft. bowl will plane about 3.6 acres per hour; with 12 ft. bowl it will plane about 4.3 acres per hour.

The Gurries plane is obtainable through all Caterpillar dealers.

Rubber Suction Hose

Manufacturer: The B. F. Goodrich Co., Industrial Products Div., Akron, Ohio.

Claims: A new water suction hose that springs back to original shape if run over by trucks or other heavy equipment has been announced by the manufacturer.

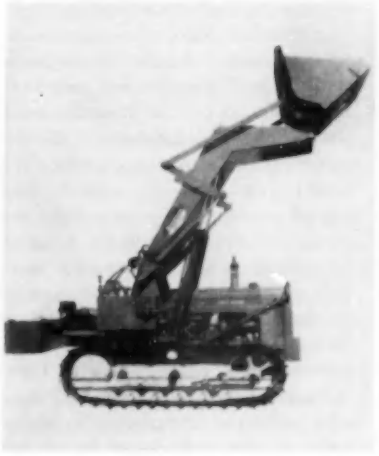
The secret of the springiness of the new hose, called "Morecon," is a continuous coil of hemp rope, specially treated and imbedded in thick rubber. Medium weight fabric plies are wrapped around the hose to support end-pull or tugging action in suction service.

The hose is recommended to handle

"Today I'm going to explain the importance of following blueprints."

normal suction with maximum working pressures ranging from 70 pounds in the 1-in. size to 40 pounds in the 3-in. size. A corrugated cover of tough black rubber resists sun-checking, abrasion and the effects of aging. The Morecon hose tube is a smooth, nonporous rubber that handles gritty and mildly corrosive fluids. The new hose is available in sizes 1, 1¼ 1½, 2, 2½ and 3 inches.

Front End Loader



Manufacturer: Henderson Mfg. Co., Inc., Cedar Rapids, Iowa.

Claims: A new compact, low clearance Krawloader for use on the John Deere 40-C 5-roller tractor is now being manufactured by the Henderson Mfg. Co., Inc.

The unit features a box-section main frame, double-action cylinders with V-packing and chromed rods; a front mounted vane type hydraulic pump, auxiliary relief valve, oil filter and control valves. A reinforced self-leveling bucket cradles the load.

The rigid yoke is V-block attached to axle bars. Ballast box beams with attached fenders are removable to allow servicing of the tractor drive mechanism. The close-coupled ballast box has a hinged top. The protective grill guard, high pressure wire braid hose, oversize linkage and pivot points are other features.

The new loader is available for 46-in. gauge, 12-in. maximum track shoe, and for 44-in. gauge, 10-in. maximum track shoe.

Hydra-Hammer Cab

Manufacturer: Ottawa Steel Div., L. A. Young Spring & Wire Corp., Ottawa, Kan.

Claims: With the need apparent for a year-around machine, the manufacturer has equipped its Hydra-Hammer with an All-Weather Cab. The new feature is said to be a definite advantage to public utilities' service departments for operations of an emergency nature, as well as regular production applications in breaking concrete, cutting asphalt and tamping backfill. It protects the driver from sun, wind, rain, sleet and snow.

The Ottawa Hydra-Hammer all steel cab has solid steel roof, and is made of 14 gauge reinforced steel throughout. All-around windows give 360° vision. Safety plate glass windows are rubber sealed. A sliding rear window provides for ventilation. The cab is 5-ft. 2-in.

high, 4-ft. long and 3-ft. 1-in. wide. The new cab fits all models of Ottawa Hydra-Hammer, and is available for machines already in the field, as well as for new models.

Heavy Duty Slurry Pump

Manufacturer: Morris Machine Works, Baldwinsville, N. Y.

Claims: A new heavy duty slurry pump, the Type RX, has been added to the Morris line.

This low speed, continuous duty pump is available in seven different models from 2 to 6-in. size. It is designed to handle abrasive slurries of cement, sand, coal, solids, and other products up to the maximum of fluid consistency under suction lift of positive head.

THE BEST FOR DIGGING!

Omaha Dragline Buckets get out and dig in for you. Tough cutting lips of alloy steel are sharp enough to sink in like a garden spade. Faster, smoother working, your Omaha Bucket finishes the job sooner . . . brings you bigger profits. Write now for complete catalog giving specifications of 4 available types.

OMAHA DRAGLINE BUCKETS

DRAKE-WILLIAMS MOUNT • OMAHA, NEBR.

New Trade Literature

Subject: **Europe's Cement Industry**
Content: *The Cement Industry in Europe*, a 70 page book, is another in a series of reports prepared by the Organization for European Economic Co-Operation on trends in main economic sectors. The newest report surveys the European cement industry and market from 1950 until the beginning of 1955. The price is $1.
Where to get: O.E.E.C. Mission, Publications Office, 2002 P St. N. W., Washington 6, D. C.

Subject: **Engineering Research**
Content: *Review of Current Research and Directory of Member Institutions, 1955*, is a 352-page publication of the Engineering College Research Council of the American Society for Engineering Education. The editions have been published biennially since 1947. The 1955 edition reports on approximately 7,500 research projects of 105 member institutions of the ECRC. More than 15,000 faculty members, graduate students and research engineers are engaged in the research projects, which require expenditures of approximately $75 million annually. All branches of engineering and most related fields are covered in the research. The index contains approximately 5,000 entries of research project subjects. The price is $2.
Where to get: Renato Contini, Secretary, Engineering College Research Council, New York University, University Heights, New York 53, N. Y.

Subject: **A-C Tractor Shovel**
Content: Pictorially presented in an eight-page catalog are the engineering, design and production features of the new Allis-Chalmers HD-11G tractor shovel. Specifications of the HD-11G are included. Ask for catalog MS-460.
Where to get: Construction Machinery Div., Tractor Group, Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Subject: **Caterpillar Bulletins**
Content: Caterpillar has announced the availability of two more booklets, a broadside and a brochure. *Danger in the Heat Zone* is an eight-page booklet discussing how heat prostration in vital parts of diesel engines can be avoided through sound metallurgy and careful machining. Ask for form DE582. It is available in English, French, Spanish and Portuguese. The machines to use for specific material handling jobs are described in a booklet, *Material Handlers at Work*. Actual customer jobs are discussed. Ask for form No. D565. A broadside mailing piece announces the addition of two engines to the Cat line, the D342 and the D339. Included in the literature is an explanation of the machining and research going into the production of the engines. Applications of the engines are illustrated. Special production methods used in the machining of crankshafts, camshafts and heads are shown. Ask for form No. 31554. Production features of the No. 933 and No. 955 Traxcavators are presented in a two-color brochure. Model views of the units in action, plus cutouts of their new features, are provided. Ask for form No. 31695.
Where to get: Caterpillar Tractor Co., Peoria, Ill., or from Caterpillar dealers.

Subject: **Washo Road Test**
Content: *The Washo Road Test, Part 2: Test Data, Analyses, Findings* is a final report on the Washo road test, which was administered by the Highway Research Board to test pavement behavior under controlled heavy truck traffic. The Washo test was conceived and sponsored by the Western Association of State Highway Officials. Among findings contained in the 212-page report are: 1, Asphaltic surfacing of shoulders increases greatly the durability and load support value of pavements; 2, test sections with four-inch surface course were far superior to sections with two-inch surface course and comparable total depth pavements; 3, pavements with four-inch surface course showed load support capacities comparable to three-inch to nine-inch deeper pavements where a two-inch surface course was used. The price is $3.60.
Where to get: National Academy of Sciences—National Research Council, Washington, D. C.

Subject: **H-5 Hydrocrane**
Content: A bulletin describes Bucyrus-Erie's new all-hydraulic, truck-mounted Hydrocrane. A four-page specifications list supplements the bulletin and is contained in a compact literature folder. Both folder and list are illustrated with on-the-job photographs. The H-5 is new from outrigger feet to boom tip. As a lifting crane it has a rated capacity of nine tons; it carries a ½-yd. clamshell bucket and can be equipped with a 39-in. lifting magnet. De-

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signed expressly for mounting on a conventional motor truck, the H-5 has a standard two-piece boom (telescoping from 24 to 36 feet in length) or optional high-lift, three-piece boom (extendable from 25 to 50 ft. long). Other features described in the bulletin are: precision hydraulic control; four patented outriggers; unique gooseneck construction at boom point; welded steel boom; sturdy alloy steel revolving frame; simple deck machinery; self-power unit and fingertip controls. Ask for bulletin H-5-1.

Where to get: Bucyrus-Erie Co., South Milwaukee, Wis.

Subject: **Prestressed Concrete Structures**

Content: *Design of Prestressed Concrete Structures*, by T. Y. Lin, covers all phases of prestressed concrete structures, with emphasis on American methods and conditions. The book begins with the materials and procedures of prestressing and continues on through loss of prestress, design for flexure, shear, bond, composite sections, continuous spans, prestressed columns and tanks. It concludes with a discussion of economics, fire and corrosion resistance, impact and fatigue strength. Lin is professor of civil engineering at the University of California. The price of the 456-page volume is $11.50.

Where to get: John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y.

Subject: **Self-Propelled Roller**

Content: The Bros SP-54 self-propelled pneumatic-tired roller is described in a four-page brochure. Every pair of wheels oscillates on the all-rear-wheel-drive roller. Unique features of the SP-54 are described. Complete specifications are given.

Where to get: Wm. Bros Boiler and Mfg. Co., Road Machinery Div., 1057 Tenth Ave. S.E., Minneapolis 14, Minn.

Subject: **Uranium Mining**

Content: *Uranium Mining on the Colorado Plateau*, by W. L. Dare, R. A. Lindblom and J. H. Soule, is the first of a series of Bureau of Mines publications describing uranium mining in Colorado. The report is designed as an introduction for persons interested in uranium but unfamiliar with mining. It discusses in detail the equipment and methods used in prospecting, exploration, development and mining. The authors are mining engineers of the Bureau of Mines and the Atomic Energy Commission. The report has many photographs. Ask for I. C. 7726.

Where to get: Bureau of Mines, Publications-Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.

Subject: **Six-Wheeler Trucks**

Content: A White Motor Co. sales folder, *Facts About White Six-Wheelers for the Construction Industry*, contains data about truck efficiency in all phases of the construction industry. The booklet has background information concerning engines, frames and axles for both on and off the road service in various construction operations.

Where to get: Advertising Dept., The White Motor Co., Cleveland 1, Ohio.

Subject: **CO_2 Welding**

Content: *Carbon-Dioxide-Shielded Consumable-Electrode Arc Welding*, a 12-page preprint of an article scheduled to appear in the *Welding Journal*, is available. Written by G. R. Rothschild of the Air Reduction Sales Co. research laboratories, the paper was presented by him at the 1955 American Welding Society national spring meeting. The article deals with the methods of supplying and the flow characteristics of carbon dioxide, the chemical activity of carbon dioxide, properties of weld metal, operating characteristics and specific applications.

Where to get: Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.

Subject: **Turbodiesels**

Content: Turbocharging is explained in a 16-page booklet issued by the Cummins Engine Co. The booklet explains what a Turbodiesel is, the advantages of turbocharging, the operation of a turbocharger and how turbocharging has been applied to Cummins diesels. Cummins produces five Turbodiesels.

Where to get: Cummins Engine Co., Inc., Columbus, Ind., or from Cummins distributors.

Subject: **Clamshell Buckets**

Content: *Maintenance & Care of Blaw-Knox Clamshell Buckets* is a comprehensive 40-page bulletin, which offers the following advice on: how to use counterweights for maximum efficiency; when to increase or decrease bucket reeving; the bending in or bowing out of bucket lips; cable life, as influenced by sheave diameters, or proper application of tag line, or application to crane; welding procedures for building up worn cutting lips, repairing fractures, among other things, in high carbon plate and cast alloy steel. Common abuses leading to early bucket failure are listed, along with proper lubrication practices. Ask for bulletin No. 2373-R.

Where to get: Bucket Dept., Blaw-Knox Co., Pittsburgh 28, Pa.

Subject: **Steel Pan Feeder**

Content: Amsco manganese steel pan feeders for mining and quarrying operations are described in a 16-page bulletin.

Where to get: Stephens-Adamson Mfg. Co., Aurora, Ill.

Subject: **Trailer Dumps**

Content: A new six page catalog, describes the complete line of Transporter, Excavator and Hitchhiker trailer dumps manufactured by Galion Allsteel Body Co., Galion, Ohio. Printed in two colors, the new catalog illustrates Models SSM, SSMF, STM and TTM Transporters, Models TTE and TTEF Excavators and Model HH Hitchhikers. Also furnished are detailed specifications for each model, covering body cubic and

Continued on page 66

BREAKER BALLS
of Ni-Hard and Semi-Steel

EAGLE Breaker Balls available of abrasion resistant Ni-Hard nickel - chromium - iron alloy for toughest jobs and of tough semi-steel for regular jobs. Pear shaped, with easily replaced hook. In 5 sizes: 1500 lbs. to 8000 lbs. Spherical in 6 sizes: 1275 to 6350 lbs.

BULLETIN 952 describes Breaker Balls, Pile Hammers, Line Weights. Catalog 55 covers aggregate, stone and ore washers and classifiers.

Since 1872

EAGLE IRON WORKS

EAGLE IRON WORKS
264 Holcomb Ave.
Des Moines,
Iowa

NOT in the Contract

A mousy little man was frightened silly by his boss. One day he told a fellow worker he was sick. His friend suggested he go home.

"Oh, I couldn't do that."

"Why not?"

"The boss would fire me."

"Don't be silly. He'll never know. He's not even here today."

Finally the man was convinced and went home. When he got there he looked in the window and saw his boss kissing his wife. So he ran all the way back to the office. "A fine friend you are!" he said to his co-worker. "I nearly got caught!"

"I wasn't drunk, your honor, I was just drinking."

"Oh, that's different. In that case I'm not going to send you to jail for a month, but only for 30 days."

"Women," remarked the old fisherman, "are deep as the blue waters of the bay."

"Right you are, sir," remarked a henpecked summer visitor, "and so full of craft."

1st Roughneck: "I hear you've been datin' my girl. Stay away from her if you want to stay healthy."

2nd Roughneck: "Thanks for the warning, but I see she hasn't wrecked your health any!"

Teacher: "How long has your father been unemployed?"

Student: "We don't know exactly; we can't find his birth certificate."

"Let's see your bait," said the native as the discouraged angler was about to give up.

The angler showed his minnows. The native fastened one by the tail to the angler's hook, pulled a bottle of corn liquor from his pocket, poured it into the bucket, "dunked" the minnow in it for a moment and said, "Now try it."

Almost immediately there was a heavy strike and after a brief struggle, a 15-pound bass was landed. Not on the hook, of course. The minnow had the bass by the throat.

"For gosh sakes! Don't send her out with your memos again boss."

A young man moved into the plains region. After several years of drouth, he singled out an oldtimer and asked:

"Doesn't it ever rain around here?"

The old man replied:

"Son, do you remember the story in the Bible about the time it rained 40 days and 40 nights?"

"Yes," said the newcomer, "but what has that got to do with us?"

"Well," said the early settler, "we got an inch and a quarter that time."

A foreman accompanied his dim-witted son-in-law into his boss' office, where he attempted to get him a job without the preliminary examination.

The son-in-law, however, could not answer the simplest questions. In desperation, the superintendent asked, "How much is seven and seven?"

"Thirteen," the boy answered.

"Aw, let him in anyway," the foreman pleaded. "He only missed it by two."

The Texan was wound up. "And another thing," he said, "in Texas we've got the fastest-running dogs in the world."

"Don't doubt it," replied the listener, "the trees are so far apart."

Little boy: "May I kiss you, Mary?"

Mary: "Not yet, I have scruples."

Little boy, throwing out his chest: "Oh, that's all right, I've been vaccinated."

After watching the squabbles that often developed in splitting of estates, we can sympathize with the old fellow whose will contained just the following: "Being of sound mind, I spent every durn cent I had!"

Two English schoolboys took a dislike to each other. The hatred intensified through the years. One became an admiral in the navy; the other a bishop in the church. Years later, they met on a London railroad station platform. They had changed. The bishop had become very plump, but they recognized each other at once. The bishop swept up to the admiral, whose medals and gold braid were glittering, and said:

"Station-master, from which platform does the 10:45 train leave for Oxford?"

The admiral promptly replied: "Platform 5, madam. But in your condition, should you be traveling?"

Excavating Engineer

WISHES ALL ITS

HARD WORKING READERS A

Very Merry Christmas

AND A

HEALTHY, PROSPEROUS AND

Happy New Year

New Literature . . .

Continued from page 63

payload capacities, hoists, chassis details, axle ratings, construction details and other data. Ask for catalog LL1234.

Where to get: Galion Allsteel Body Co., Galion, Ohio.

Subject: **Conveyor Belting**

Content: A wall chart on the proper selection and maintenance of conveyor belting is offered to conveyor users by Hewitt-Robins, Inc.

Where to get: Hewitt-Robins, Inc., Stamford, Conn.

New Movies . . .

Subject: **Steelmaking**

Content: Eight 16 mm. sound color movies describing the production of steel, and important finished products are being made available by the Colorado Fuel and Iron Corp. The manufacture of rails, wire rope, grader blades and reinforced concrete is pictured as well as the manufacture of products essential to the mining, agricultural and construction industries. Suitable for all age groups, the selection includes a series titled "Indian Paint" describing how iron ore was originally used by the Indians for war paint. Each of these films describes the process of steelmaking, and details the manufacture of one or more steel specialty products.

Where to get: The Colorado Fuel and Iron Corp., New York Advertising Dept., 575 Madison Ave., New York 22, N. Y.

Subject: **Highway Safety**

Content: A 20-minute film, *The Last Mile*, has been released by the Caterpillar Tractor Co. to promote highway safety. The film points out dangers involved when construction crews begin the job of turning an old overcrowded and poorly maintained road into a safe, modern highway. The film contains a message for both the motorist and the construction worker. The film was shown for the first time Oct. 17 to the construction section of the National Safety Council at Chicago.

Where to get: Caterpillar Tractor Co., Peoria, Ill.

Kansas Turnpike . . .

Continued from page 29

pressors, a Shramm 115 and Gardner-Denver 600, were also used.

All concrete forms were fabricated on the job, using ¼-in. plywood for panel forms and ¼-in. plywood for lining. Ready Mix Concrete, Inc. of Lawrence, Kan., supplied 13,227 yards of concrete for the all-reinforced concrete piers. The piers required 516,610 pounds of reinforcing steel. The abutments were fitted with caps 69-ft. long and 7-ft. wide to hold the superstructure. Superstructure work was to be done by Maxwell Bridge Co., Columbus, Kan.

In addition to the equipment previously mentioned, a Caterpillar D7 did backfill work and an International 2½-ton truck did much of the hauling.

In charge of the bridge project was Harry C. Zachau, general superintendent for Massman. Wes Hale was assistant superintendent and H. B. Webster, project engineer. K. C. Bloom was resident engineer. Project engineering firm is Howard, Needles, Tammen & Bergendoff of Kansas City and New York.

Approach Contract Let

Approaches to the Kaw River Bridge were being constructed by List and Clark Construction Co., Kansas City, on a 3.32 mile grading and drainage contract amounting to $715,114. At the time of *Excavating Engineer's* visit, its work was approximately 16% complete. The contract was awarded May 5. Work started the same day. Eight months were allowed for completion.

West of the bridge, to the Santa Fe tracks, approximately 1,000 feet of fill were required. This was being done in a separate operation. From the east end of the bridge to Highway 24, a distance of approximately 500 feet, fill work was also going on. This section extended from the west end of the Highway 24 overpass to the overpass of the Union Pacific Railroad.

Additional fill in the approach to the highway overpass was included in the List and Clark contract. Its grading and drainage contract on this section extended approximately two miles to the east of the highway toward Kansas City.

An estimated 2 million yards of earth fill was required. This was being loaded from two borrow pits by a Manitowoc 4500 with a special 8-yd. Hendrix dragline bucket and a Northwest model 80-D with a 3½-yd. Hendrix dragline bucket. Ten 21-yd. and nine 25-yd. Euclid bottom dumps hauled approximately three quarters of a mile to the fill area. At the crossing of Highway 24, special temporary stop lights were installed. These were manually operated. Traffic was held up momentarily while the big rubber tired units roared hastily across to dump their loads and return.

The fill to the west of the bridge was

Here's teamwork as a 38-B and a Gardner-Denver 600 compressor combine for sheet pile driving at pier No. 5. A McKiernan-Terry 9 B-3 pile hammer did the driving.

dumped with eight 12-yd. Tournapulls. Spreading on both sides was done by six Caterpillar graders and several Allis-Chalmers HD-21 dozers. A 6,000-gal. water tank drawn by a Euclid 43FDT tractor was used to aid in compaction and keep down dust. The borrow pits were located in bottom lands of the Kansas River flood plain. Although the weather was extremely hot—80° to 104°—and dry, enough moisture remained in the soil for good compaction.

Compaction of 100% was required to a point 200 feet from each end of the bridge. The rest of the section called for 90% compaction. To accomplish this, three 50-ton rollers, one a Bros and two Fergusons, were used. They were drawn by Allis-Chalmers HD-20 and HD-21 tractors. Several HD-20's were also used on other assignments, such as clean-up around the loading shovels.

The List and Clark contract included setting drain pipes, culverts and toe drains along its entire section. A little concreting, around boxes and drains, was also required.

A. B. Peters was superintendent on the List and Clark spread and Bob Barker was project engineer. Other men in charge were M. F. Hall, Euclid foreman, John Lindsay, Euclid night foreman, and D. W. Foster, in charge of the Tournapull section.

By late 1956, traffic should be moving smoothly along the entire 236-mile turnpike from Kansas City to the Oklahoma-Kansas border. The turnpike consulting engineers, Howard, Needles, Tammen & Bergendoff, estimated that completion could be accomplished in two construction seasons. Opening of the $160 million project was scheduled for October 1956.

"H-How d-d-did you g-g-uess I operate an air h-hammer?"

Lime Plant . . .

Continued from page 39

market-size rock. The ½-in. minus fines are routed directly to a dust mill. The ½ to 1½-in. size is either dumped into railroad hopper cars beneath the plant for direct shipment to customers or is stockpiled for use in lime manufacture by the Dolomite plant.

Old Machine Still Good

One of the unique features of the relatively modern production line setup at the Flux reduction plant is the use of what is believed to be the oldest power shovel still active in Utah. The machine is a Bucyrus-Erie Type 1035 two-motor electric shovel which was sold initially to American Smelting & Refining Co. at Topliff, Utah, in Feb. 1931. Utah Lime & Stone Co. purchased it in 1938. For many years the shovel did direct loading against the limestone face of that era. The old shovel, now in service nearly a quarter century, has easier work these days. It is used for loading ½ x 1½-in. limestone rock out of a surge pile for delivery by truck to the Dolomite plant.

This old machine, however, is active 12 months of the year and has stood up well without excessive maintenance. Too much maintenance on the machine could become a serious production problem because the supply of raw material to the Dolomite plant depends on its continued operation. This old shovel celebrated its 24th birthday this year, which also is the 75th anniversary of its manufacturer, the Bucyrus-Erie Co. of South Milwaukee, Wis.

Calciners Work At Capacity

The demand for finished lime has grown so greatly that Utah Lime & Stone is a principal supplier to the chemical industry, with some sales to the building business. The plant produces no agricultural lime. Currently operating at capacity, the Dolomite lime-burning plant is being enlarged by the addition of a fourth calciner.

The Dolomite plant now has three Ellerman calciners. They take the ½ x 1½-in. limestone rock and, with the help of Buffalo blowers and No. 4 fuel oil burners which generate 2,350° F, change the chemical composition of the raw limestone. In the burning process, CO_2 is driven out, along with impurities. After its burning, limestone rock,

Heavy-Duty
FLOOD LAMPS

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Especially Designed for Efficient Service on

Shovels • Excavators • Drag-Lines • Roadbuilding Equipment Locomotive Cranes • Tractors . . .

Metal Spinning Division

PHOENIX PRODUCTS CO.

4723 N. 27TH ST. • MILWAUKEE 16, WIS.

Write for Illustrated Bulletin.

which weighed 86 pounds per cubic foot initially, weighs approximately 50 pounds per cubic foot.

Each Ellerman calciner discharges the finished lime particles to a common surge bin where feeders transfer it through a Williams hammermill. Part of the limestone dust, after being ground through the hammermill, is passed through a hydrating process. Other lime passes through standard commercial processes. The Dolomite mill has Link Belt screw conveyors for loading railroad cars directly in bulk. A bagging machine packs the lime in 50-lb. bags. Average output of each calciner is approximately 15 tons each 24-hour shift, with operations continuing around the clock.

From all appearances, Utah Lime & Stone Co. will be in business for many years. Practically an unlimited supply of good lime rock exists in the 15-mile-long property owned by the company in the vicinity of Grantsville. Today's quarry and production methods are far better than the old days when gangs of men hand-picked the stone and loaded it into wood-wheel and iron-wheel carts for delivery to sizing screens, which were then hand-fed. Some of these old carts are still located on the property. Their only function now is to remind the 30-man crew how much the company has progressed in the last three decades. And it seems a safe bet that other types of modernization will be added as the lime market expands.

Proper Maintenance . . .

Continued from page 47

cable and then let out enough cable to adjust the position of the apron.

To keep the cable from "free spooling," keep the cable control brake engaged while moving to the dumping area and to the cut.

A "cable saver" is available on some scraper units. Basically, the cable saver consists of a master cylinder and a slave cylinder, connected hydraulically. The master cylinder for the ejector cable is located at the forward end of the ejector track and the master cylinder for the bowl-lift cable is located on the gooseneck near the upper nest of bowl-lift sheaves. Both slave cylinders are located on top of the cable control housing.

As the ejector and bowl approach their limit of travel, and before contacting the stops, the master cylinder is tripped and actuates the slave cylinder which forces the cable control lever to the hold position.

Notes from the Manufacturers

Allis-Chalmers Mfg. Co., Tractor Group, Milwaukee, Wis., has named J. D. Harmison as manager, parts sales. He had been tractor sales manager, Farm Equipment Division, since Oct, 1952.

Le Roi Div., Westinghouse Air Brake Co., Milwaukee, Wis., has opened a branch plant at 5000 45th West Ave., Tulsa, Okla., to serve as headquarters for its Southwestern sales region. The branch also will serve as Le Roi's petroleum industry headquarters. The Tulsa organization will engineer, fabricate and assemble a complete line of Le Roi gas booster compressors and air drilling compressors. The plant also modifies basic Le Roi engines to conform with customer specifications and requirements. The plant also includes a replacement parts store and an extensive warehouse.

La Crosse Trailer Corp., La Crosse, Wis., has announced the semi-retirement of William F. Funk, 85, former president of the company. He has been with the business 64 years. He will continue as chairman of the board. The business was founded 90 years ago by his father, Michael Funk. Newly appointed LaCrosse officers include: Francis J. Duffy, president; David F. Hyde, vice president; Robert J. Funk, secretary-treasurer.

Clark Equipment Co., Jackson, Mich., has appointed Donald E. Stoops as manager of distributor sales for the Transmission Division. Stoops formerly was advertising and merchandising manager of the division. Clark has named four new distributors to handle the line of transmissions, torque converters and axles manufactured by its Automotive Division in Buchanan and Jackson, Mich. The companies and their territories are: John M. Shank Co., White Bear Lake, Minn., in Minnesota, Wisconsin, Nebraska, Iowa and Michigan's Upper Peninsula; H. A. Davis Power Equipment Co., Dallas, Tex., in the northern half of Texas; Brunken Corp., Ashtabula, Ohio, in the New England states, New York, New Jersey, eastern half of Ohio, Pennsylvania, Delaware, North Carolina, South Carolina, Virginia and West Virginia; Richler Brothers, Montreal, Que., and Toronto, Ont., in the provinces of Ontario and Quebec. Clark announced that its two wholly-owned subsidiaries, Clark Leasing Corp. and Equipment Finance Co., had completed arrangements with a group of seven banks for a three-year combination term loan and revolving credit totaling $20 million. Clark Leasing Corp. operates a leasing program for Clark's customers for its industrial trucks and construction machinery units. Equipment Finance Co. handles financing for Clark's 150-member dealer organization in the United States and Canada.

Bucyrus-Erie Co., South Milwaukee, Wis., has appointed the Syracuse Supply Co., 294 Ainsley Dr., Syracuse, N. Y., to offer sales and parts service on Bucyrus-Erie excavators and cranes in the central New York state area. The firm will handle the full line of ⅜ to 4-yd. convertible excavators and cranes equipped with gasoline, diesel or single-motor electric power units; 15-ton and 25-ton capacity Transit Cranes; the truck-mounted all-hydraulic Hydrocrane and Hydrohoe; and Bucyrus-Erie dragline buckets. The territory covered by Syracuse Supply Co. extends through central New York from the Pennsylvania border north to the St. Lawrence River and includes the following counties: Clinton, Franklin, St. Lawrence, Jefferson, Lewis, Herkimer, Oswego, Oneida, Cayuga, Onondaga, Madison, Tompkins, Cortland, Chenango, Otsego, Tioga and Broome.

Caterpillar Tractor Co., Peoria, Ill., has announced the election of G. E. Burks as vice president. He has been with the company 26 years. He had been director of engineering and research since 1954. Dale Wright was appointed chief metallurgist. He succeeds Glen C. Riegel, who retired. Wright has been with Caterpillar since 1934. T. H. Spencer replaces Wright as Peoria plant metallurgist.

Continued on page 72

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 18 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

SHOVELS DRAGLINES DRILLS TRACTORS TRUCKS

190-B Bucyrus-Erie electric 8 yd. shovel;
170-B Bucyrus-Erie electric Hi-lift 5 yd. shovel;
1600 P&H 6 yd. electric shovel;
2400 Lima 6 yd. diesel shovel;
2400 Lima 4 yd. Hi-lift shovel;
120-B Bucyrus-Erie electric 5 yd. shovel;
1400 P&H 4 yd. electric shovel;
111-M Marion 3½ yd. diesel shovel;
4161 Marion 5 yd. electric shovel, worked about three years;
1201 Lima 3½ yd. diesel shovel;
1201 Lima Hi-lift diesel shovel 42' boom, 32' stick, 2½ yd. dipper;
1201 Lima semi-hi-lift diesel shovel, 36' boom, 27' stick, 3 yd. dipper;
3500 Manitowoc Hi-Lift diesel shovel 45' boom, 35' stick, 2 yd. dipper;
111-M Marion Hi-lift diesel shovel 43' boom, 23' stick, 3 yd. dipper;
40-A Marion Hi-lift diesel shovel 45' boom, 34' stick, 2½ yd. dipper;
450-W Bucyrus-Erie diesel dragline 165' boom, 13 yd. bucket;
625 Page diesel dragline 150' boom, 9 yd. bucket;
5-W Bucyrus-Erie diesel dragline 125' boom, 5 yd. bucket;
2400 Lima diesel dragline 130' boom, 5 yd. bucket;
4500 Manitowoc diesel dragline 120' boom, 5 yd. bucket;
1055 P&H diesel dragline 80' boom, 4 yd. bucket;
1201 Lima diesel dragline 85' boom, 3 yd. bucket, Independent boom hoist;
3500 Manitowoc diesel dragline 85' boom, 2¼ yd. bucket;
600 Reich heavy truck mounted rotary air drill;
50-R Bucyrus-Erie blast hole drill—drills up to 12" hole;
Quarrymaster drill with 2—500 cu. ft. compressors;
58-BH Joy Champion rotary air drill;
56-BH Joy Middle weight rotary air drill; also 42-T, 29-T, and 27-T well drills.

Many Good Used Trucks

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l Bank Bldg.
Hazleton, Pa.
Phone GLadstone 5-3658

Bucyrus-Erie model 150-B Ward Leonard electric shovel, pushbutton starting, separately driven exciter, Tri-Ten dipper handle, available with six cubic yard rock dipper or special seven cubic yard dipper; serial no. 101329; shipped August 1953; excellent condition; location: South Dakota. Box 3598

Lima 2400 dragline equipped with 110' boom, two 7-yard Hendrix HS buckets, one 6-yard ESCO bucket, Kohler light plant; machine powered with Caterpillar D-397 diesel engine and torque converter; 63" wide treads; long caterpillar frames; machine shipped September 1950; completely overhauled June 1955; engine completely overhauled April 1955; Approximately $5000 in spare parts available; Price, as is where is, $115,000. Box 3677

Bucyrus-Erie 120-B shovel serial no. 37106 with two 5 yard dippers and spare long handle with 4 yard dipper; also includes about 2,000 feet power cable and a considerable quantity repair parts; good working condition; location State of Washington; price: $87,500. L. E. Dixon Company, 409 South California, San Gabriel, California.

Six cubic yard dipper and Tri-Ten handle for Bucyrus-Erie 150-B Shovel; slightly used but in excellent condition. Box 3588

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

One—Ingersoll-Rand, model QM-2 Quarrymaster equipped for 6" hole with 40' steel changes; two —500 cfm Diesel driven aircooled compressors with regulators; purchased new 1952; overhauled and rebuilt Feb. 1954; not used since; Located Eastern Pennsylvania. Box 3679

Two TM-500 Joy wagon drills; never used, cost $14,000 new; Price: $5,000 each; clamps, steels, bits, couplings, shanks & adapters; $3,130 cost; Price: $2,100. Also 3-5 yd. dipper dredge buckets; each $500. The L. A. Wells Construction Co., 1121 Schofield Bldg., Cleveland 15, Ohio.

Bucyrus-Erie 38-B crane only—1948, Caterpillar motor, like new, 65 or 70-ft. boom, counterweight, fairlead, tagline—$20,500.

Bucyrus-Erie 38-B shovel, rebuilt General Motors diesel motor—new tracks—$21,500.

50-Foot crane boom for 38-B Erie with tagline, counterweight, catwalk, fairlead, has never been on a machine, cost $4,100; will sacrifice, make an offer.

Model #6 Northwest 1949 shovel, Murphy diesel engine; shovel, $21,500; backhoe, $5,000 with shovel.

1949 International TD9 Bucyrus-Erie 1-yd. shoveldozer, new tracks, $5,400.

Two LaPlante-Choate 15-yard scrapers—open top, can be used for shovel loading—$3,850 each.

Slusser-McLean scraper, 10-12½ yards—$1,000.

D8 Bulldozer with all new pins, bushings, sprockets and idlers, 1940, hydraulic 2-drum power control unit—$6,000.

Northwest 2½ yard shovel front only.

NW-25 shovel front for use with crane and attachments.

25-Foot boom for Link Belt crane, top and middle sections.

65-Foot boom for NW-6 crane with bridle, struts, gantry.

Backhoe for ¾-yard model 25 Northwest.

Peerless 4" deep well pump with 4-cylinder Wisconsin motor, new, in crate—$450.

Rear mounted Hughes-Keenan crane for D7 which has hoister winch—$200.

Two-drum power control units for TD14 or TD18 —$350 each.

Two-drum, 2-niggerhead cargo winches, electric motors; one new, one used $450 each.

Manganese dipper fronts for 2-yard Lorain, 2½ yard Marion; also fronts, backs, doors for 2 yard Northwest, 1½ yard Link Belt, all new; these parts fit other machines—½ price.

Kohler light plant for shovel or crane, Wisconsin air-cooled gas motor—no reasonable offer refused.

Kerrick Kleaner, like new—$350.

All prices quoted subject to prior sale; all of this equipment is my own and can be seen at below address; if you need, or want to sell, any other equipment, please let me hear from you. R. E. Cunniff, 393 Brookline Street, Newton Center 59, Mass.; Phone: LAsell 7-4300.

Bucyrus-Erie 15-B, ½ yard positive crowd shovel, 15' 6" boom, 12' 6" handle, fully enclosed steel cab, independent power boom hoist, 20" cats 10' 7" long 8' 3½" wide, International UD-9 diesel engine; this machine is in excellent shape and is a very exceptional buy.

Bucyrus-Erie 15-B, ½ yard dragshovel, 16' boom, 7' dipper, with 24" bucket, Buda gas engine with electric starter; this machine is in good shape. Phone: Lexington 9-4313 or wire collect to: S. M. Christhill and Son, Inc.; 134 West Mount Royal Ave., Baltimore 1, Maryland.

MISCELLANEOUS EQUIPMENT

Shovel equipment for BUCYRUS-ERIE 38-B dragline, clamshell, crane or dragshovel, including 21' boom, 17'5" handle, 1½ cu. yd. dipper with cast lip inserted teeth, padlock, boom machinery including complete crowd machinery, dipper trip, saddle block and rope. Moraines, Inc., 4842 Dempster St., Skokie, Illinois. Phone: Orchard 3-4260.

New 18" dredging pump, rectangular cross section casing, high alloy steel liners, high alloy cast steel 4 vane runner; spare liners. Box 3587

EQUIPMENT WANTED

Backhoe attachment for Michigan rubber-mounted T-6-D shovel. J. P. Waite Construction Co., 3304 West Pierce Street, Milwaukee, Wisconsin.

POSITION WANTED

Operator (33) 15 years experience in Europe, Africa and Americas: know repair, maintenance & overhaul; all equipment; mostly British and American excavators; prefer South or Central America; experienced in control of native labor; can do setting out and use level; speak fluent Italian, some Spanish. C. Cannon, 28 Horton House, Meadow Road, London, S.W. 8, England.

HELP WANTED

SALES ENGINEERS

Explosives manufacturer with nationwide distribution has attractive openings for men with technical background or practical experience as sales engineers; age, under 30 preferred. Starting salary commensurate with experience. Considerable traveling is required. Liberal benefits. Every incentive for advancement.

This is an excellent opportunity for the application of your knowledge of mining, quarrying, construction, and related industries.

Send complete resume. Photograph optional. All correspondence will be held in strict confidence, and references will not be contacted without permission of applicant.

Box 3680

75 YEARS of BUCYRUS-

Bucyrus-Erie builds a complete line of oil well, water well, and blast hole drills. Here is the new rotary-type 50-R, largest Bucyrus-Erie blast hole drill.

Here is the newest Bucyrus-Erie shovel — the 3-yd. 71-B. Other models range from ⅜ yd. up.

December 18 marks Bucyrus-Erie's 75th Anniversary. In the years since 1880, the company has been proud to bring many significant advancements to the design of excavators and drilling equipment . . . the first electric and the first diesel excavators . . . the first crawler-mounted dragline . . . the first heavy-duty, full-revolving stripping shovel . . . the first all-steel churn drill . . . the first all-hydraulic truck-mounted crane . . . and too many more "firsts" to detail here. Most important, however, the know-how back of these is yours in whatever Bucyrus-Erie machine you use.

Gives you better performance today . . .

You can expect top performance from a Bucyrus-Erie machine. It starts with the design — Bucyrus-Erie designs are backed by the experience gained from thousands of machine-years of service. Bucyrus-Erie machines are *right* in every respect.

Parts are properly proportioned, operating functions are effectively balanced. The results are high output, maximum time on the job, and long life. The extras Bucyrus-Erie puts into the design and construction of excavators, cranes, and drilling machines pay off many times in added output and lower cost operation.

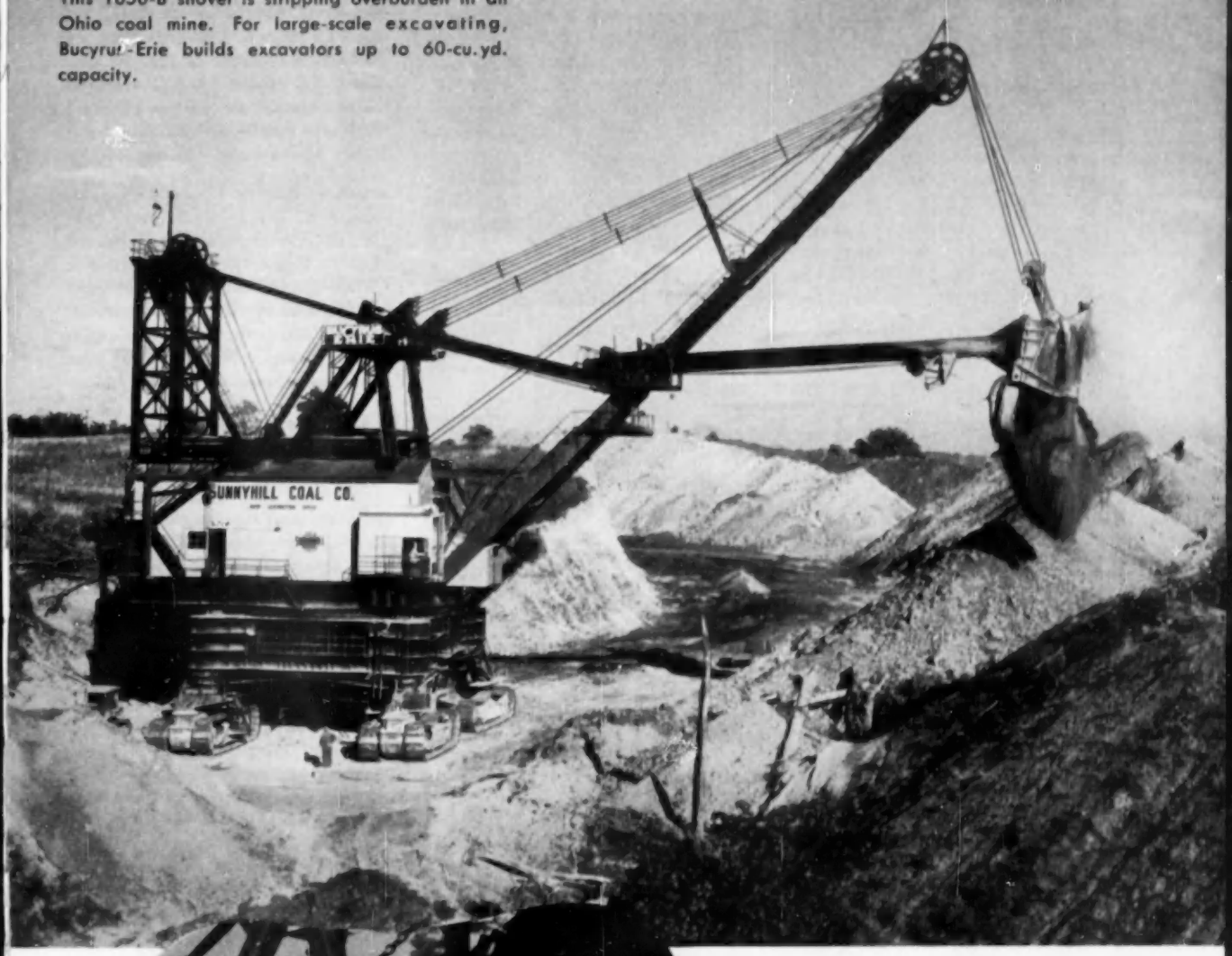
Promises even better machines tomorrow

You can expect even higher performance standards from Bucyrus-Erie machines in years to come. The development of new and improved designs, and the search for better materials and more efficient manufacturing methods never ends. With facilities unsurpassed in the industry, Bucyrus-Erie promises machines that will serve you better than ever.

38Y55C

ERIE LEADERSHIP . . .

This 1050-B shovel is stripping overburden in an Ohio coal mine. For large-scale excavating, Bucyrus-Erie builds excavators up to 60-cu.yd. capacity.



President Theodore Roosevelt Visits Panama Canal: This Bucyrus-Erie shovel, one of 77 used on the Big Ditch, was included in his 1908 inspection tour.

BUCYRUS ERIE

South Milwaukee
Wisconsin

1880 **75** 1955

YEARS OF SERVICE
to Men Who
Shape the Earth

Notes . . .

Continued from page 68

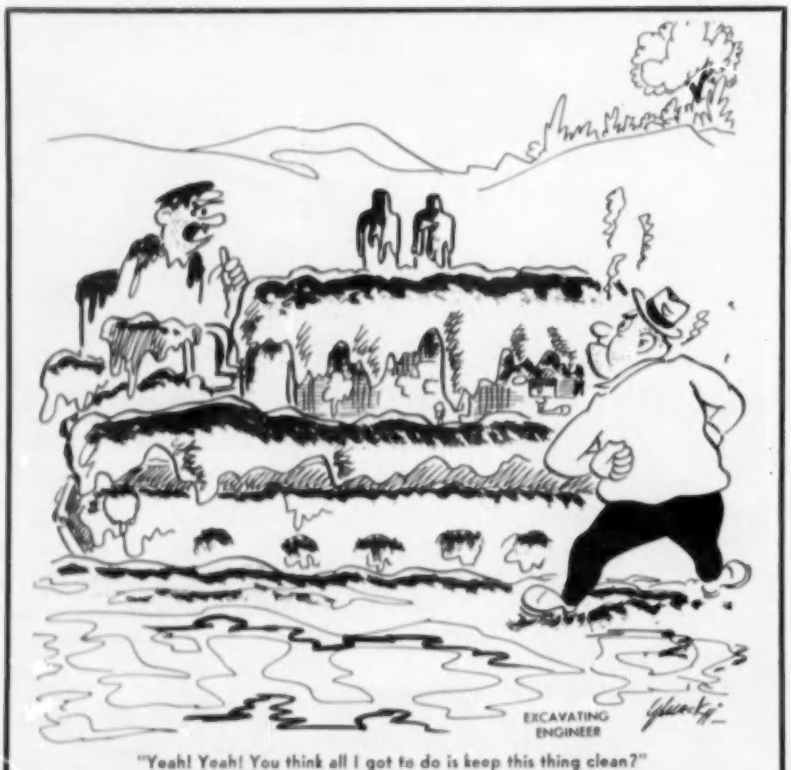
T. W. Peck succeeds Spencer as heat treat manager. R. C. Brown was appointed as director of research. He succeeds J. M. Davies, who was named an assistant to Burks. C. R. Maxwell, assistant director of research, also was named an assistant to Burks. R. D. Henderson and C. H. Stein were appointed assistant directors of research.

Gardner-Denver Co., Quincy, Ill., has established an engineering scholarship fund that is part of the Gardner-Denver foundation. Scholarship grants are given to schools which are leaders in their specific fields. The student selection for scholarship grants will be made by the schools on the basis of their requirements, jointly agreed upon by the company and the schools involved. To date, 11 scholarships or fellowships have been awarded. These were spread among nine different colleges.

Pioneer Engineering Works, Inc., Minneapolis, Minn., has named the Finn Machinery Co., 1342 W. Church St., Orlando, Fla., as a distributor of its line in the Florida counties east of and including Gadsden, Liberty and Franklin and north of and including Sarasota, DeSoto, Highlands, Osceola and Brevard. Finn Machinery maintains a branch office at 3755 N.W. 25th St., Miami.

Harnischfeger Corp., Milwaukee, Wis., has appointed seven district managers for its newly-organized Construction and Mining Division. They are: Philip C. Petry, Boston (Mass.) district; Raymond M. Calkins, Birmingham, Ala.; Alfred E. Hoehler, Pittsburgh, Pa.; Andrew B. Conner, Detroit, Mich.; Gordon E. Leopold, Minneapolis, Minn.; Herman E. Sutter, Kansas City, Mo.; Jack G. Walker, Dallas, Tex. Richard B. Maxson was named sales engineer in the Buffalo office.

Chain Belt Co., Construction Machinery Div., Milwaukee, Wis., has announced the appointment of David B. Lovejoy as assistant sales manager of the division. The company also announced a territorial addition for Spreitzer, Inc. The addition includes the Iowa counties of Dubuque, Jackson, Clinton, Scott, Muscatine, Louisa, Des Moines and Lee.



"Yeah! Yeah! You think all I got to do is keep this thing clean?"

Timken Roller Bearing Co., Canton, Ohio, has appointed Robert G. Wingerter as general manager of the Automotive Division. He succeeds Edgerly W. Austin, who retired after being with the company since 1919. Wingerter was formerly assistant general manager of the division.

H. K. Porter Co., Inc., New York, N. Y., has announced the election of Robert C. Houser as treasurer. He succeeds James C. Leslie, who resigned to become President of Holgate Co., Kane, Pa. Rocco J. DiFonso was named assistant treasurer and Edward R. Moran was appointed assistant secretary by Porter.

Cummins Engine Co., Inc., Columbus, Ind., has appointed Peter Ster, Jr., to serve as regional manager for Eastern Canada with headquarters at Toronto, Ont. He will serve as direct factory liaison man in the provinces of Ontario, Quebec, New Brunswick, Nova Scotia, Newfoundland and Labrador.

L. B. Foster Co., Pittsburgh, New York, Chicago, Houston, Los Angeles and Atlanta, has opened warehousing facilities at Buffalo, N. Y., for both standard and lightweight steel sheet piling, steel H-bearing piling, steel rail and track accessories. Existing warehouse facilities in Amsterdam, N. Y., and the New York City area have been augumented.

American Tractor Corp., Churubusco (Ft. Wayne), Ind., has appointed Theodore A. Haller as vice president and director of engineering. He had been associated 23 years with the crawler tractor division of the Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Marquette Cement Mfg. Co., Chicago, Ill., has announced plans for the immediate construction of a 1,250,000-barrel-a-year cement manufacturing plant at Milwaukee, Wis., to serve Wisconsin and northern Illinois markets. Marquette said that the plant would employ the first "double-pass" Lepol kiln to be installed in the United States. The Lepol kiln has been used by European cement manufacturers for many years. The Milwaukee plant is part of an $18 million Marquette expansion program which will give the firm nine producing plants in eight states of the Midwest, South and Southeast.

How to keep crawler parts operating longer

Replacing worn shovel parts is costly ... for example, the sprocket, tumbler and track assembly illustrated, which represents a considerable outlay.

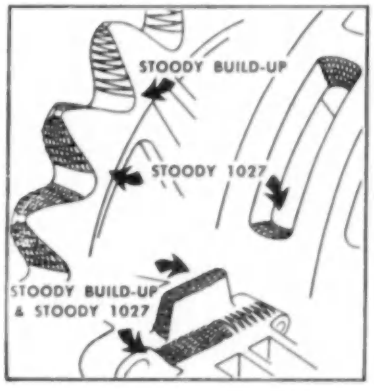
The experience of a large pipeline company operating in the West, provides a good example of maintenance procedures that cut replacement costs and save lost equipment time. Two sets of sprockets, tumblers and tracks are maintained for each backhoe. The spare set is rebuilt and hard-faced on regular shop time. It is ready for instant use when needed. When the track shows signs of slipping, the rebuilt equipment is sent out, worn parts are removed and the spares installed on location.

NUMEROUS ADVANTAGES

Work schedules in the welding department are thus smoothed out, since rebuilding and hard-facing jobs can be used as "time fillers" at the welder's convenience without overtime costs.

Shovel down-time is reduced. Only enough time is lost to pull worn assemblies and substitute the spares. Shovels are immediately put back on the job.

Although no exact record is available, careful observation over a long period of time indicates an almost indefinite increase in service life for these specific parts. The procedure has proved so successful it is now adopted as standard practice.

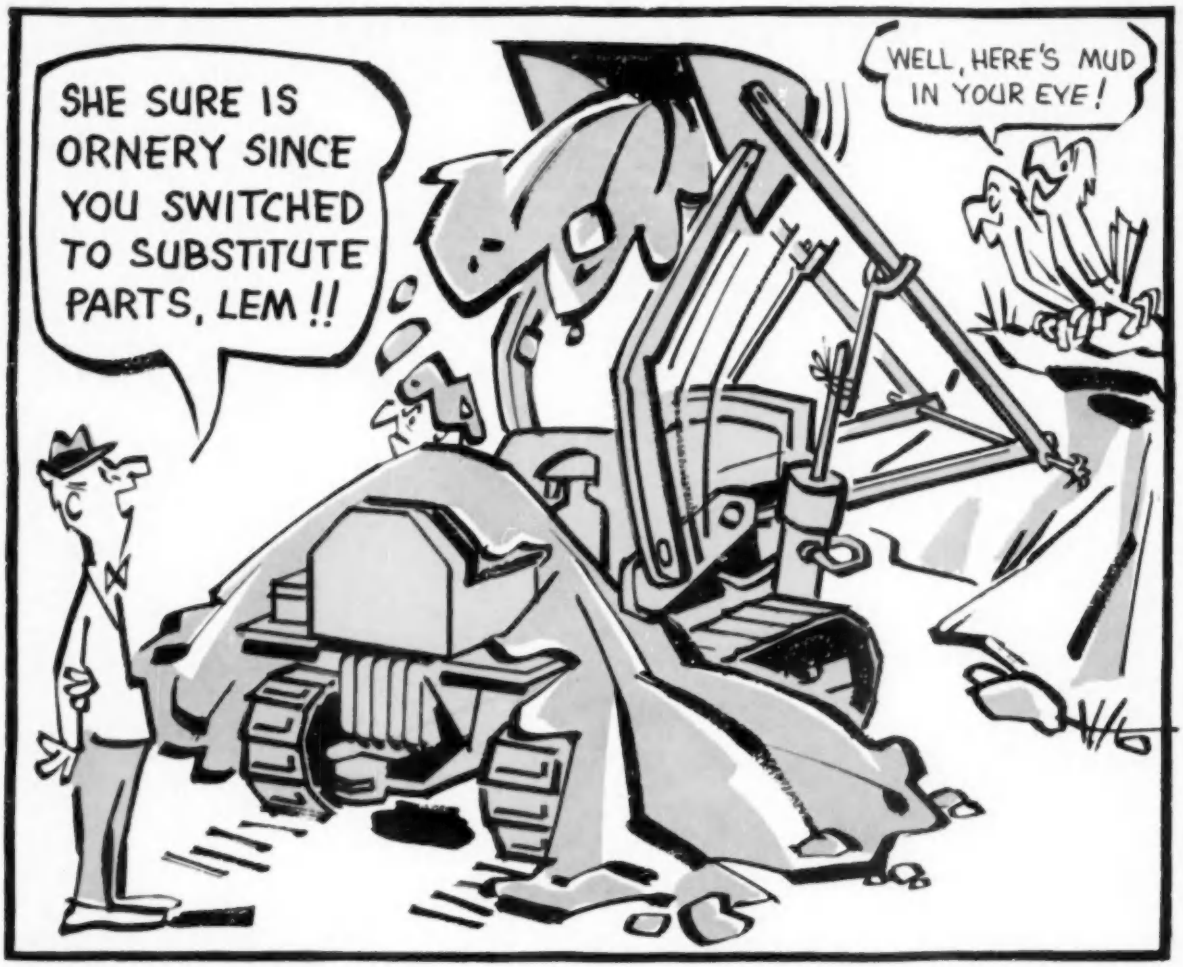


REBUILDING & HARD-FACING PROCEDURES

Wear patterns are the key to the most effective use of hard-facing. Worn areas of sprocket teeth, lugs and tumblers are rebuilt to within $\frac{3}{16}$" of final size with Stoody BUILD-UP, which provides a rigid base to properly support the hard-facing alloy. A final pass of Stoody 1027 supplies good wear resistance with high impact strength. These same alloys are used on the pads to restore size and renew life.

These and other hard-facing applications are fully described in the Stoody Guidebook. Ask your Stoody dealer or write for a free copy.

STOODY COMPANY
11948 East Slauson Avenue
Whittier, California



Down time is no joke. It happens, though. Maybe when intake and exhaust valves go bad.

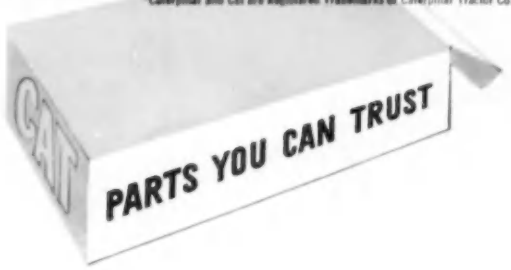
If you replace with genuine Caterpillar valves, here's what you're sure of: valves designed to *fit properly* in your Caterpillar engine, and that means heads held to amazingly close tolerances, stems accurately machined, keeper tapers precision-ground, faces machined true to the center line of the stem. You're sure of valves *hardened* for longer wear. All around, you're sure of *less* down time in the future.

If you replace with substitute valves—can you be sure of anything?

Better get genuine Caterpillar parts every time.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CAT® valves are made of special nickel-chromium alloy steel. Even at high operating temperatures, they resist distortion, corrosion and erosion.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.